

The Australasian MANUFACTURER

SERVING ALL INDUSTRY

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AFTER BUSINESS HOURS

Antidotes to Boredom

(By Elliott Stone.)

The views expressed in articles published in this section are those of the contributors and not necessarily those of "The Australasian Manufacturer." They are selected for their interest value, whether controversial or not, and the comments of readers on the subject discussed are always welcomed by the Editor.

LET me start at the end of this attempt to be helpful to those many people to whom the luck of life has brought a job which happens to consist mainly of doing the same uninteresting job over and over again, or a job which is tedious and without any sense of satisfaction when it is done.

"Boredom," states my wonderful dictionary, "is a state of being bored."

So far so good; but not very helpful to the victims.

Boredom, as I understand it, means that some of us are not able to be happy as we do our jobs.

Being happy, as I understand it, is to be able to get some definite satisfaction out of what I do.

Satisfaction with the job means that the job is done as well as I am able to do it and, I always like to hope, done reasonably well; with the thought, ever at the back of my mind, which assures me that there may be a better way to do the job; and it is up to me to discover that way; and use it if possible.

Ah! Now we're at the boredom state again.

But with a difference; we know where we are.

We know that if we can arrange our thoughts in such a

way that they give us a sense of satisfaction, or pleasure, or delight, we shall not suffer from boredom.

It seems easy enough.

The next step is to put the job into a kind of inspection chamber and have a really good look at it.

What amount of brain effort does it need; how much of the brain effort is there left to fight against the boredom the job brings with it?

So a kind of battle of wits begins.

It is boredom against satisfactory interest in something other than the job.

We know as much as we want to know about boredom; that state of mind which causes us to wish all manner of things, often impossible, as a relief to the misery we endure for the sake of the necessary pay-pocket.

While we are routine jobbing with little zest, there are several other things we can do without danger to the good work we find it necessary and worth while to do.

We can think; we can talk; we can look; we can listen; we can remember; we can imagine; we can sing; we can, perhaps, do a little P.T.; which means that we can do a little exercise with some of our limbs which will help them to be more fit for the things we do when we are not on the pay-pocket job.

On the whole we seem to have a fairly good collection of possible means of fighting boredom.

Colours and bright lighting; bonus schemes; profit sharing; promotions; good working conditions; ample food are all those extras which a management can introduce into the factory routine. I have a book of more than three hundred pages which tells the story of one of the most successful tailoring organisations in England.

I find that almost every possible form of social services, sport and entertainment within a reasonable range, is provided for the men and women who work in the factories.

Lesser organisations may not be able to do as much but it often happens that some little special feature of extra convenience to the workers gives that sense of

pleasant anticipation which, at least, keeps boredom at bay for the time being.

Even I, a mere old man, can imagine that a young girl—or any girl up to eighty years of age—feels a little less like "chucking the job" if she is well aware that, within an hour or two, she will be in a kind of film star world where a luxurious hairdressing and hair-do (I think that's the word) experience is waiting for her.

While the management side of a firm can often do much to make the job easier to do and less tedious, the worker is almost always the best person to help herself out of a state of boredom.

The simple need is what I call "thought control."

It is only necessary to discover that we can, with practice, think about what we like to think about, for the bored worker to be able to enjoy her job to some extent, instead of being bored with it.

This is so simple that I shall not be believed; but it is quite a practical plan.

I only knew one woman who, at the end of a long life—when urged to think of something cheerful—retorted with bad grace, "I ain't never had nothing nice to think about." It was a bad naughty lie, of course; but the woman died, as she had lived for so long, sorry for herself.

Ah! That's a thought, too.

Thinking about one's-self, and one's affairs, is often the wrong thing to do unless one can think of the jolly times and the happy times and find they more than out-balance the less enjoyable experiences.

On the whole most of us have a balance on the right side if we are really honest-to-goodness about it.

I often feel that management might do something about this boredom with the job problem if they could concentrate more upon helping the workers to think about pleasant things.

There's a running electric newspaper which could be brought into use for the purpose. The very latest news is usually of interest even to the gloomy worker; and I do not doubt it would be possible to extend the idea to a short story—or even a serial—for the

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purpose. Prizes for guessing the end of the story might be a good investment.

Visitors to the factory help. Some years ago I paid a visit to Port Sunlight. Visitors were very warmly welcomed at that time; special staffs were trained to meet them and take them round the two-hour special "visitor's walk", which meant that not only were the visitors keenly interested in the workers; it meant, too, that the workers were interested in the visitors.

I can easily believe that the workers, when they saw the "London lot"—nearly a thousand of us—by special train—were "taking us out of winding" in true feminine fashion; just as we were doing the same to them; with the memory still in my mind of some two or three dozen hefty young women swinging heavy hammers as they knocked nails into packing cases at a rate no London man could ever hope to beat or equal.

Nor do I doubt but that visitors were a constant antidote to any sense of boredom the girls and men might feel later.

One merry young woman—now married with two babies and a man to look after—and well she does it—replied to my enquiry about this matter: "We never got 'fed up'; we were always jolly about something; we always found someone who had had a bit of luck and so we were always kept from being downhearted; it's the girls and the foreman together who make a job jolly; if the foreman has a smile, the girls

have it; and if the foreman has a frown, the girls have that, too." Which seems to me to have a moral in it for everyone concerned.

OUR FOOD PRODUCTS.

DISPLAYS INVITED FOR U.S. SHOW.

Overseas manufacturers of food products are invited to take part in an International Food Exposition in Chicago, U.S.A., from June 9 to 15, 1951.

The following communication regarding it has been made available by the American Consular service in Australia:—

"The Department of Commerce has been officially advised by the General Council of The National Association of Retail Grocers that an International Food Exposition will be held in the Navy Pier, Chicago, Illinois, from June 9 to 15, 1951. This Exposition will cover not only food and food products, but also a large variety of items sold in grocery stores and products which grocers find useful in the operation of their stores.

"The National Association of Retail Grocers is one of the oldest and largest trade associations in the country. It is the recognized national spokesman for the nation's 375,000 independent retail grocers who last year did a total business of approximately \$20 billion. These independent grocers have facilities to serve the food

requirements of 100,000,000 persons in the United States. The Association has almost 600 states and local associations of food retailers affiliated with it in every state and section of the country. The national headquarters of the Association is at 360 North Michigan Avenue, Chicago 1, Illinois.

"Customs legislation along identical lines of that approved for the Chicago International Trade Fair has been introduced into the House of Representatives by Congressman Sabath, of Illinois.

"The Association is going to conduct that part of the Exposition devoted to foreign exhibits and exhibitors through a separate corporation to be called the International Food Exposition, Incorporated. This organisation is to be entirely financed and controlled by the Association, and will be a non-profit corporation under the laws of Illinois.

"For some months we have been attempting to find out what trade associations in the United States would willingly invite foreign participants in their trade shows. We are hopeful of getting the information on this general subject within the next few months. We feel that the action of The National Association of Retail Grocers is, therefore, highly significant and could well be the forerunner of International Expositions in other industries. Furthermore, we believe that not only the participating countries, but many of the others as well, all have special food products which appeal to the American taste. In

addition, many of the countries may have particular specialised equipment for use in grocery stores, such as scales, meat-cutting implements, food-handling products, etc.

"Interested parties in each country should communicate directly with the National Headquarters, 360 North Michigan Avenue, Chicago 1, Illinois."

PRIZE FOR DESIGN FOR EXHIBITION.

Two thousand circulars calling for competitive designs for the cover of the prospectus for the 1952 Exhibition had been sent by the S.A. Chamber of Manufactures to art schools throughout Australia, the general secretary of the Chamber (Mr. H. D. Winterbottom) said recently.

A prize of £50 was offered for the winning design. All designs would be exhibited in a special section of the Exhibition and, with the exception of the winning design which would become the property of the Chamber, would afterwards be returned to the entrants.

Designs must be suitable for reproduction in three colours, or four colours if the trichromatic process were used, on cream art paper 7½ in. wide by 11 in. deep.

Consideration would also be given to the suitability of the design for a poster advertising the Exhibition.

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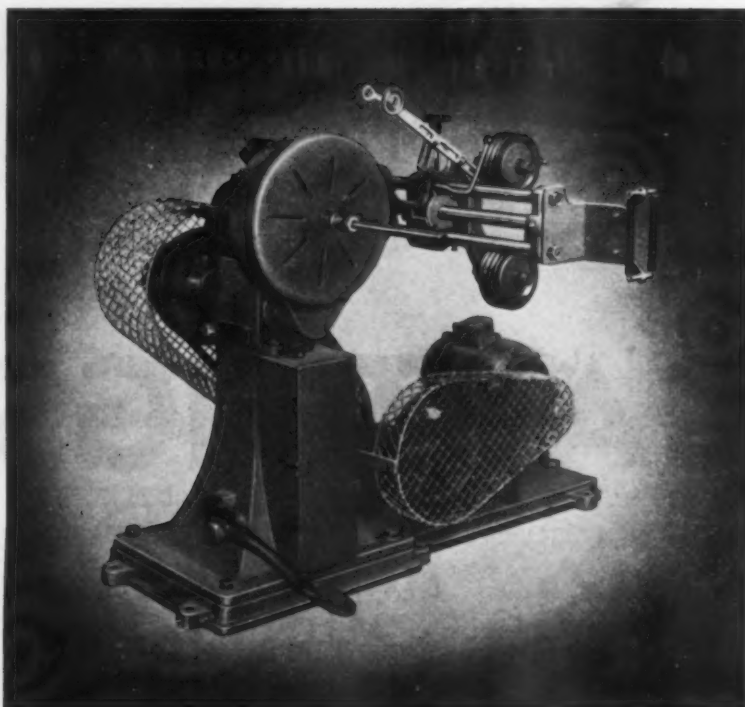


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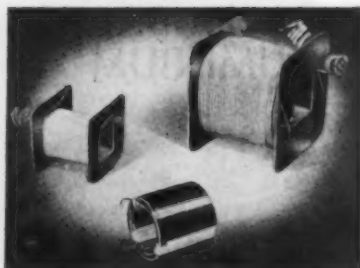
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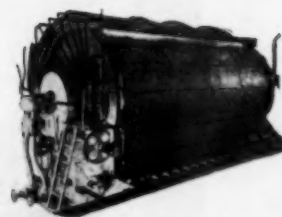
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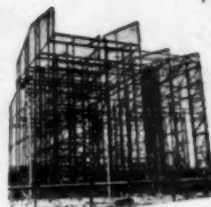
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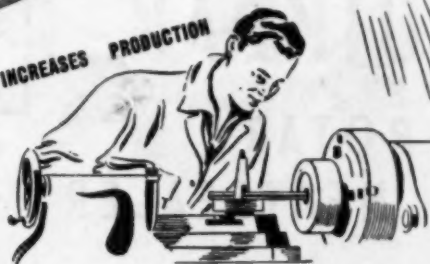
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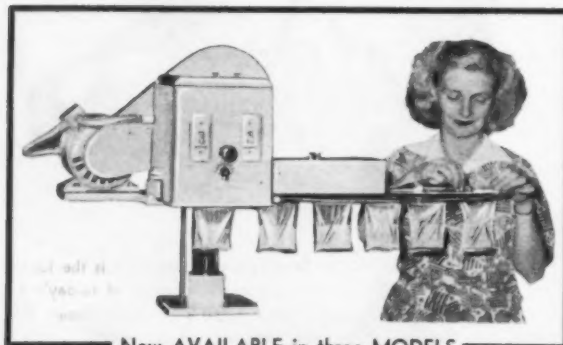
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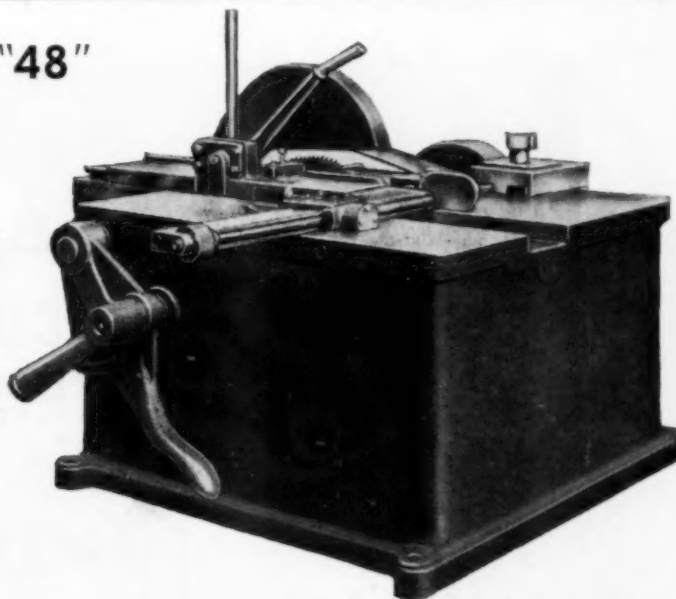
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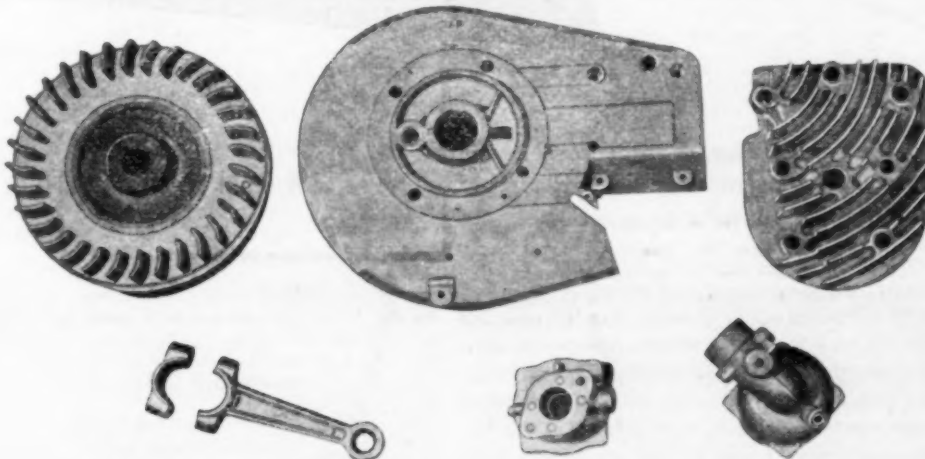
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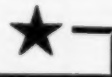
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PAGE FIFTEEN SEPTEMBER 16, 1950.



Industry and Government Evolutionary Changes Down the Years

"Constructive co-operation between business and government is just as vital to economic welfare and progress as the much more frequently discussed need for co-operation between management and workers. Without bold and enterprising business, government cannot hope to realise its central aims of full employment, maximum production, and economic security. And, on the other hand, unless government is successful in its central aim of preventing large-scale unemployment, business will suffer the losses and bankruptcies which follow inevitably from economic instability . . . The mixed economy, in which a large degree of government control is associated with a much larger degree of private enterprise, is likely to be with us for a very long time to come. It is time both business and government started to give some hard thought on how to obtain the best results from the mixture."—Extract from article in the latest issue of the "I.P.A. Review", issued by the Institute of Public Affairs.

THIS article, which interestingly details the increasing extent to which government is impinging on industry, constitutes a challenge to the modern industrialist, first, to acquaint himself thoroughly of the present-day world-wide trends in the matter of government-business relationships; and, second, having convinced himself of the inevitability of the new order, to co-operate actively and constructively to promote the highest national good.

The "I.P.A. Review" points out that prior to World War I, and for the subsequent ten years in the United States, it was an accepted dictum that business was business and government was government and that the more the one kept its fingers out of the affairs of the other, the better it was for everyone concerned.

Then came the Great Depression, followed some few years later by World War II. Both of these cataclysmic events wrought a veritable revolution in the industrial sphere. "Government," says the "I.P.A. Review", "from being a more or less interested observer, and occasionally an umpire, came right into the arena as an active and even controlling participant. Business and government were no longer separate entities moving independently in their own distinct spheres of activity. Their concerns began to touch at many points, and they found themselves to be partners in a common enterprise devoted to the objective of economic welfare—although there soon sprang up violent disagreements between the partners on the way in which the enterprise should be run."

Main contributing factor to the change was, of course, the Great Depression which discredited the long-held idea that the automatic forces

of the free market, provided it was kept sufficiently free, could be relied upon to guarantee the maintenance of economic stability at high levels of employment in the post-war world. In order to lift themselves out of the slough of the depression of 1929-31, different countries resorted to different means—Australia, for example, had its Premiers' Plan, the United States its New Deal, other countries adopting such measures as they considered would best meet their needs. All plans in all countries had this in common—government, because of economic pressure and of public opinion, was forced to interfere with normal economic processes so that recovery might be promoted and distress relieved.

The period between the two World Wars saw a growing acceptance of the fact that governments would have to play a more positive part in stabilising economic conditions and preventing large-scale unemployment.

The outbreak of World War II gave a tremendous impetus to the growing trend, when, under the stress of war, governments assumed, temporarily, almost complete responsibility for the functioning of the entire economic mechanism. The extent to which this happened in this country is so fresh in the minds of industrialists that there is no occasion to enumerate here the various aspects of the business and national life which came under government control. Nor was that all. For, as the "I.P.A. Review" emphasises: "And even after the storm tides of war had receded, government had to continue in control to clean up the vast confusion of economic flotsam and jetsam that remained, so that business enterprise could operate again with reasonable effectiveness to supply the peace-time needs of the people."

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Then followed discussion and counter-discussion as to how long controls should operate, discussion not only still at variance at this date, but likely to so continue for an indefinite period.

Two major points, however, have been demonstrated. First, that the level of economic activity of employment cannot be exposed to the risks inherent in the free price market; and second, that government is obliged to assume a measure of responsibility for guaranteeing that its people shall be provided with a seemly standard of food, shelter, education, and health.

As readers of "The Manufacturer" know full well, it has maintained consistently, and will continue to maintain, that government regulation

should be reduced to the lowest possible level compatible with national progress and national security. It feels, nevertheless, that the issue is of such far-reaching importance that it should be the subject of serious study. It considers, accordingly, that the Institute of Public Affairs has rendered a national service by its fearless discussion of this profoundly significant question, a question destined to grow in importance in the industrial field.

For in no sphere of the national economy is active co-operation more imperative than as between government and manufacturers, the men conducting the enterprises on which ultimately depend national progress, national prosperity, and even national security.

Pithy Jottings of Industry and Industrialists



Scenes at the N.S.W. Chamber of Manufactures' annual dinner at the Hotel Australia last week. (Upper left), Mr. R. J. Webster, President of the Chamber, proposing the toast, "The Parliaments". Also shown at the head table are (left to right), Senator J. I. Armstrong, Mr. R. G. C. Parry-O'Keden, Lieut.-General Sir John Northcott, Governor of N.S.W., Senator Neil O'Sullivan, Sir Douglas B. Copland. (Above), Mr. Parry-O'Keden, who is Senior Vice-President of the Chamber, responding to the toast, "Australian Industry". At left is a general view of the gathering during a speech by the Hon. V. H. Treatt, Leader of the State Opposition.

MANAGEMENT AND WORKERS.

At the annual dinner of the Chamber of Manufactures of New South Wales, held in Sydney last week, the Minister for Trade and Customs put forward the suggestion that employers should grant reasonable claims by employees "instead of dragging them through the courts." "It is very often true," he declared, "that in industrial disputes, justice delayed is justice denied. Australian employers are among the best in the world, but a small minority are among the worst. It is this small minority that can cause discontent and disruption in industry. In a free and enlightened country like Australia there is no reason why bitterness should be introduced into industrial disputes." "The Manufacturer" agrees with those sentiments. We desire to point out, moreover, that the overwhelming majority of manufacturers are ready and willing to grant reasonable claims. Surely the Minister will agree, however, that when the claims are unreasonable, as they very frequently are, they must be submitted to the Arbitration Court, which was instituted for that specific purpose.

President of the Chamber, Mr. R. J. Webster, made a good point when he said that State and Federal Governments should support the manufacturers because the factories, though working only a 33 to 34 hour week (allowing for black-outs) delivered goods cheaper than those imported duty free.

MORE CAPITAL FOR BEETLE-ELLIOTT.

At the recent annual meeting of Beetle-Elliott Ltd., the deputy chairman, Mr. H. M. Gibbons, said that the Company might call for further capital to finance plant extensions.

The extensions were for resins and moulding powders, some of which had been imported.

Selling prices of some products were now lower than when production began three years ago, because moderate tariff protection enabled the company to retain the bulk of the Australian market.


FORTHCOMING ANNUAL MEETING OF ASSOCIATED CHAMBERS.

It is announced that the annual conference of the Associated Chambers of Manufactures of Australia is to be held in Melbourne on December 6th and 7th next. There will be a meeting of the Executive Committee before the General Meeting—at 2.30 p.m. on Tuesday, December 5th, 1950.

HOLLINS MILL APPOINTMENT.

Mr. A. D. McDougall, who is well known in the Australian textile industry, has been appointed general manager of the Villawood (N.S.W.) mill of Hollins Mill of Australia Ltd.

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Around & About the FACTORY



A digest of new factory and plant construction, additions, alterations and improvements, and operating news of Australian industry.

Automatic Stud Welding Fixture

Cuts Production Time 65 Per. Cent.

A time saving of 65 per cent. in one phase of the manufacture of electric generators is among the advantages now being real-



The operation shown is the welding of studs to generator housings. The use of stud welding equipment, supplied by the Lincoln Electric Company, has cut production time 65%.

Used by G.M.F. Electric Co. Pty. Ltd., of Camperdown, Sydney, through the substitution of the

new stud welding process for former costly drilling and tapping operations.

This application is in the fixing of four 1 1/2 in. x 5/16 in. studs to the rolled mild steel generator frame for holding the feet castings in position. The time required to jig load, drill and tap these four 5/16 in. holes was formerly 4 minutes. Using the Nelson equipment floor to floor time has now been cut to 1 1/2 minutes.

As can be seen from the illustration, the fixture employed is very simple in design. The generator housing is positioned on a rotating jig and the gun, slide mounted, is moved into its position for loading and firing by a 2-way air cylinder. The air cylinder is controlled by a foot valve, and the gun is fired by the normal trigger mechanism.

The jig used rotates horizontally only, and thus, after the two studs parallel to one edge are welded, the housing is turned over for completion. To ensure accuracy and speed in location, the jig is indexed for the two stud positions.

As a result of the savings achieved with the present installation this Company has plans for fixtures incorporating stud welding to eliminate other time costly operations of a similar nature.

Cotton Products for Industry

Manufactured by Australian Cotton Mfg. Co. Pty. Ltd.

Cotton products of one type or another are in constant use over an extremely wide section of the manufacturing field. Apart from dress materials, they enter largely into the upholstery incidental to the furniture and motor body building trades; into the mattresses which form so important a part of the bedding industry; and into the wraps which are used extensively in the meat export trade.

These, however, are only some of its many uses. For in the form of cotton waste it has applications as many and as diverse as there are branches of production.

Australian Cotton Manufacturing Co. Pty. Ltd., 90-92 O'Riordan Street, Alexandria, New South Wales, rank among Australia's foremost makers of these utility products. Their modern factory is equipped with the latest type machinery specifically designed for the making of individual lines, which machinery is operated by highly skilled technicians.

The highest quality raw materials are used in the manufacture of each item of their varied range, a range embracing white and coloured cotton waste; for all industrial purposes; wool waste

for axle boxes, etc.; stockinette, which is proving itself an excellent polishing agent in the factory and in the home; lightweight meat wraps to enclose the carcasses shipped overseas; fibre; pads; waddings; cotton and wool flock; garnetted cotton and garnetted wool; insulating and carpet underfelts for offices, hotels, hospitals, and private homes—cotton products, in short, superior in quality and modern in production which spell cleanliness and hygiene in whatever sphere they are utilised.

Each individual product fills a vital role, in that it is either a

component part of a significant whole—for instance, the wadding in high class upholstery or the flock in good quality mattresses; or it makes an important contribution to industrial efficiency and industrial hygiene—the waste, for example, which keeps equipment clean and therefore at peak efficiency and which at the same time guarantees that cleanliness which is synonymous with pleasant working conditions.

The undertaking prides itself on the speed with which it can guarantee delivery, every department being geared to ensure speedy and continuous operation.

New Conveyor Belt Development Announcement

The Goodyear Tyre & Rubber Co. (Australia) Limited has announced its intention to manufacture new type Conveyor Belts in Australia of endless cord construction.

This new conveyor belt, exclusive to Goodyear, is a result of



The top belt shows the conventional conveyor belt construction, while the lower belt shows the new Compass Cord conveyor belt construction.

many years of exhaustive laboratory research in an endeavour to broaden the usefulness of conveyor belt systems for the transportation of bulk materials.

The rubber-covered belt carcass is comprised of longitudinal rows of high tensile cords and has at least twice the strength of conventional woven fabric. It has been proved first in the laboratory, thence in miniature and finally in full scale installations.

The advantages claimed for the Compass Cord Conveyor Belts are

many.

- (a) Lengths of single flight conveyor belt installations can be immediately doubled.
- (b) Flexibility, a most vital need where small pulleys are used in restricted spaces, such as underground mining, is vastly superior.
- (c) Transverse flexing, that is the correct angle of the belt between the troughing idlers, is improved.
- (d) True running of the belt is outstanding.

The world-wide Goodyear Organisation pre-tested the belt design with a few very old and trusted friends in different countries and industries, thus ensuring a distinct variety of operating conditions. The final analysis of each performance proved conclusively that this new type of belt was superior.

Australian industrialists will welcome this new type of conveyor belt that is designed to keep pace with the ever-increasing demands of mechanisation in industry.

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SEE PAGE 36

HARD-TO-GET SHEET & STRIP STEEL MATERIALS

Our sheet strip cutting project is designed to make available to Steel Stammers, etc., a continuous supply of bright and black steel strips. We cut to your desired width and supply in easy-to-handle 30 to 40 lb. bundles ready for use, or easy stacking and storage. Our competitive prices are available on application. Interstate orders F.O.W., country orders F.O.R., package and freight extra — prompt delivery for any quantity.

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24-gauge black Sunstar sheet, sizes 5ft. to
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STEEL DISCS

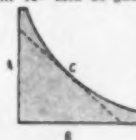
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Available in a constant supply of 18-
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Size 60in. long
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can be stripped to any width required.

BLANKING SECTIONS

For blanking circles, triangles and similar
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in 18- and 20-gauge deep drawing steel.



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| 1. A—15in.,
C—21in., in 18 gauge. | B—15in.,
in 18 gauge. |
| 2. A—15in.,
C—20in., in 20 gauge. | B—15in.,
in 20 gauge. |
| 3. A—24in.,
C—25in., in 20 gauge. | B—18in.,
in 20 gauge. |
| 4. A—19in.,
C—26in., in 20 gauge. | B—22in.,
in 20 gauge. |
| 5. A—11in.,
C—18in., in 20 gauge. | B—13in.,
in 20 gauge. |

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FIGURE NO 741

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FULL PARTICULARS supplied on request

2-Way 'Phones in Ambulance

S.T.C. makes first installation of mobile equipment for P.M.G.'s Service

On August 1, the new house-to-car and car-to-car radio 'phone service through the G.P.O. was put into operation for the first time in N.S.W. by Manly-Warringah Ambulance. Two "first call" ambulances attached to Manly Headquarters are fitted for this service, and others will be equipped in the near future.

After the test, Mr. E. H. Cox, Manly Ambulance Superintendent, said that everything was completely satisfactory.

"The call went through very clearly, and was picked up immediately," he said. "We diverted an ambulance to pick up a transport case in Warringah Shire, and saved 15 miles running."

The P.M.G.'s new system enables vehicles to contact headquarters, doctors or hospitals—in fact anyone on the telephone within and beyond the metropolitan area. When required, calls between vehicles may also be connected by the operator of the P.M.G. service. Communication on other two-way radio installa-

tions is confined to calls between vehicles and a fixed station.

An ambulance is one of the most difficult types of vehicles to equip because of the absence of a boot as in a passenger car or the large loading space of a utility. However, the small size of the S.T.C. transmitter-receiver unit permitted the installation in the main part of the vehicle without in any way interfering with the normal use or carrying capacity of the ambulance. The control unit and handset are mounted on the lower edge of the dashboard in the conventional manner.

The mobile radio-telephone subscribers' service is part of the P.M.G.'s expansion programme in the field of communications. This service fulfils a long felt need of individuals and operators of small fleets, as much valuable time can be saved and running costs reduced when it is possible to communicate with a moving vehicle. For some considerable time, radio-telephone systems have been used by public utilities and large

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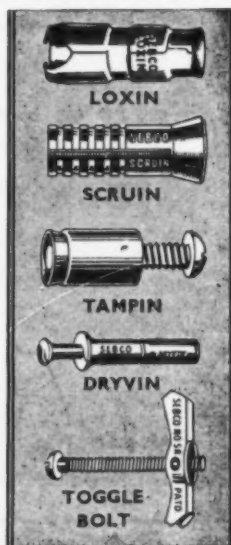
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organisations with a number of vehicles sufficiently large to warrant the installation, operation and maintenance of fixed station equipment. However, for the individual or smaller organisation, such facilities have not been readily available, partly because of the cost factor, and partly because of the reluctance of the authorities to license individual radio communication systems employing comparatively few vehicles. The number of operating channels in the frequency bands allotted to this class of service is strictly limited and the best possible use must be made of each one.

With the new service, all of the fixed radio equipment is provided by the P.M.G., and the operator of the motor vehicle provides only the radio equipment in-

stalled in the vehicle. Even with this system it is obvious that a number of subscribers must share a given frequency channel, but with the selective calling system used, only the selected car receives the call. The operation of the S.T.C. "Selecto-Call" system is such that a bell rings in the desired car, while all other cars are unaware that a call is in progress. Should the driver be absent from the vehicle when a call is made, he finds a red lamp burning when he returns, indicating that he should call the exchange.

The base station transmitter, receivers and control equipment installed in Sydney and Melbourne and shortly to be installed in Adelaide by the P.M.G. Department, were manufactured by Standard Telephones & Cables Pty. Limited.

"Ferobestos" Plastics and "Ferodo" Linings

Relatively new arrivals into the plastics world, with a wide diversity of uses in the engineering field, are "Ferobestos" technical plastics, plastics possessing important physical and mechanical properties.

These "Ferobestos" plastics are non-metallic laminated asbestos

materials, bonded into hard, insoluble, and infusible substances with special thermo-setting resins. Developed prior to the outbreak of World War II, they were utilised extensively throughout the campaign in aircraft and in other items of military equipment.

MONEL JOINT RINGS

corrugated Taylor type resist

the cutting action of superheated steam under high pressure. Sizes ranging from 2" to 18" bore are available from stock, whilst special shapes can be quickly made to order.

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They are manufactured in standard and special grades, possessing, accordingly, varying compositions and qualities, but possessing in common the following outstanding features: High strength relative to weight; high resistance to heat and to chemical action; low moisture absorption; low starting and running friction; and fair electrical resistance.

Vitality important point in their favour is their easy lubrication, which may be effected by any fluid (water being among the best). They are, moreover, highly resistant to abrasion, even when unlubricated.

These technical plastics are proving eminently satisfactory for bushes and bearings of many kinds; rubbing pads; guides; gear-wheels; rollers; valve discs and seatings; steam piston and pump-bucket rings; pump and compressor blades, etc. Among their many applications, where light weight and structural strength are major considerations, may be cited panel-lining and flooring for aircraft.

"Ferobestos" is machined easily, and comes forward in rod, tube, or sheet form, or, where specifically required—as mouldings.

In a different category, but doing work equally important in a different sphere, are "Ferodo" brake and clutch linings. They are backed by half a century's technical experimentation and specialised experience, the technical experimentation

carried out at the "Ferodo" test-house at Chapel-en-le-Frith, England, recognised as one of the most effectively equipped in the world; and the experience born of years of association with some of the world's leading engineers, using the world's finest equipment.

The range of "Ferodo" brake and clutch linings comprises woven or moulded, metallic or non-metallic, together with grades with the correct frictional and heat-resisting properties to ensure reliable service in virtually every industrial application.

Both of the lines here described are manufactured by Ferodo Ltd., Chapel-en-le-Frith, England (a member of the Turner and Newall organisation), their Australian distribution being in the hands of the following important enterprises:—Queensland (Brisbane): Philip Frankel Pty. Ltd., Elphinstones Pty. Ltd., Westcott Hazell (Engineering and Steel Ltd. New South Wales (Sydney): Westcott Hazell and Co. Ltd., Westcott Hazell Engineering and Steel Ltd. Victoria (Melbourne): A. I. Campbell and Co. Ltd., Westcott Hazell Engineering and Steel Pty. Ltd., E. A. Machin and Co. Pty. Ltd. South Australia (Adelaide): A. I. Campbell and Co. Pty. Ltd., Duncan and Co. Ltd., Westcott Hazell Engineering and Steel Ltd. Western Australia (Perth): William Adams and Co. Ltd.

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Electro-Magnetic Can Conveyor Has Many Possible Applications

The electro-magnetic can conveyor illustrated is an experimental equipment, the purpose of which is to facilitate the handling of empty syrup cans during manufacture, and convey them to the filling department, in a manner least likely to cause damage to their enamelled surfaces. There are many other possible applications.

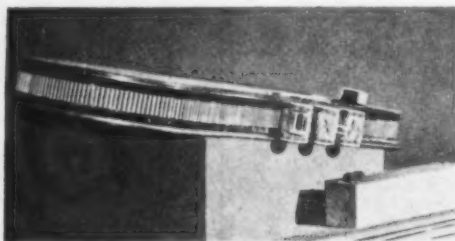
The conveyor is an elongated electro-magnet and incorporates a vertically placed track to which the cans adhere, upright, like keepers across the poles of a magnet. The track, along which the cans move by rolling on their rims, consists of a pair of running rails and a middle (motivating) rail, and all three rails constitute poles of the electro-magnet. The cans are propelled along the track by travelling waves of magnetic force which are induced in the middle rail. As each can remains automatically at the crest of a wave its speed depends on the speed of the travelling waves, which is variable, and the spacing coincides with that of the wave crests.

The magnetic circuit of the conveyor is of E-shaped cross section. It consists of a back plate, or yoke, to which are attached along the upper and lower edges two steel strips, or false running rails, and along the middle a steel bar, or middle rail. To the front face of the steel bar is fastened a large number of bent steel strips of U-shaped section assembled closely side by side so as to form, in effect, alternate teeth and slots along the face of the middle rail. The running rails proper are screwed to the false rails and are of brass in order to avoid the risk of sticking and excessive friction which would result from the use of steel rails.

The conveyor is energised from a D.C. source. The windings are in two portions, of which one is a developed D.C. armature wind-

ing laid in the slots in the face of the middle rail and connected to a stationary commutator; and the other is a main exciting, or field, winding consisting of elongated coils laid behind the armature winding and parallel with and embracing the middle rail.

The object of the field winding



This elongated electro-magnet is a conveyor for empty syrup cans, which roll along the vertical track on their rims, propelled by the waves of magnetic force.

is to provide the m.m.f. necessary to hold the cans on to the track, which is magnetized so that the middle rail is of one polarity and the running rails are of the opposite polarity throughout the length of the track. The purpose of the armature winding is to concentrate the m.m.f. along the middle rail at uniformly spaced points, which are made to travel along the rail by means of brush-gear revolving round the stationary commutator to which the winding is connected. Current is passed to and from the revolving brushes through slip-rings, the brushes being driven by a small variable speed motor. It is convenient for this to be a D.C. machine the armature of which is supplied from a potentiometer-

connected rheostat, enabling the speed to be varied down to stand-still.

The two windings are connected in series, but the operation would not be unduly affected if a parallel connection were used since the "back e.m.f." generated by movement of the cans is very small.

An important feature of the design is the strong locating or "synchronizing" force which the device possesses. This has been

Improved Pulping Machine

Fruit pulping, to remove the unappetising portions of raw soft, and cooked hard fruits prior to further processing, is often carried out by the actual fruit pickers. Since this seasonal—and sometimes casual—labour is not only mechanically unskilled, but also frequently unfamiliar with any type of machinery, the equipment should be simple. It should also be free from crevices in which the glutinous pulp can lodge and congeal.

A machine embodying these requirements has now been developed. Extreme simplicity has been achieved: dismantling merely calls for unscrewing two bolts, and reitting, screwing them up again. A completely new design eliminates crevices from the working parts.

These improvements derive from close investigation into the part played by each component. It was found, for instance, that two-thirds only of each sieve bears the brunt of the work, and that consequently the sieve's life would be prolonged by use in reverse. Similarly, nylon brushes, favoured by some manufacturers, proved unsatisfactory with, e.g., cooked whole apples, owing to the fibre's low melting-point.

The machine itself is driven by a 3 h.p. totally enclosed electric motor. The fruit passes from a hopper of stainless steel, like all parts in contact with the product, to the tilted pulping cylinder. Here it is forced by brittle or nylon brushes through sieves, with perforations respectively 0.04, 0.084, 0.137 and 0.188 in., 10.16, 2.35, 3.425, 4.700 mm in diameter. The pulp, according to type, is produced at 2 to 5 tons an hour. A high-duty 6 h.p. model is equally fool-proof in action, easy to maintain, and free of cleaning troubles. [2581].

achieved by a suitable pitching of the coils of the armature winding in conjunction with a correspondingly chosen spacing of the revolving brushes. The effect is that the distribution or "wave-form" of the m.m.f. along the middle rail has pronounced narrow peaks and broad valleys. In this manner the desired large synchronizing force is obtained with a minimum expenditure of electrical energy.

Oscillations of the cans set up by irregularities in the rims or the running rails are minimized by a damping (squirrel-cage) winding laid in the slots with the armature winding. Sparking at the commutator is also greatly reduced by the damping winding. [2581].



OIL HYDRAULIC EQUIPMENT

Rotary Vane pumps



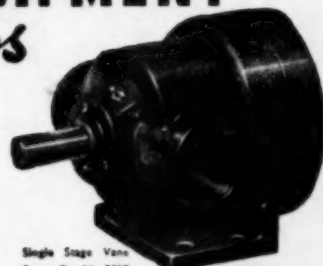
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Sectional View Single Stage Vane Pump, Cat. No. 2057, Series A.

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Furfural is the parent Furan compound from which the two alcohols, the acid and hydrofuranamide are derived.

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Furfuryl Alcohol (FA) is an amber mobile liquid, extremely sensitive to acids and resinifying readily in their presence. This latter property forms an extremely valuable basis for important commercial uses of FA.

Tetrahydrofurfuryl Alcohol (THFA) is water white to pale yellow, a mobile liquid, completely miscible with water. It is an excellent dye and resin solvent; its esters are very suitable as plasticizers, and THFA finds general use as a chemical intermediate.

Furoic Acid is a white solid containing the furan nucleus in storage-stable form. Semi-commercial quantities are available.

Hydrofuranamide is a brownish yellow solid available in semi-commercial quantities.

Your enquiries are always welcome, and full details about the uses of this interesting chemical family are readily available.

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Friction Screw Press for Hot Stamping

The high-speed friction screw press shown in the accompanying illustration, was recently constructed for the hot stamping of duralumin components and similar work. The maximum pressure at the bottom of the stroke is 1,000 tons, the stroke of the slide 28 in., and the distances between

from left to right and 36 in. from front to back.

Control of the slide movement is effected by compressed air through the medium of a hand-controlled valve at the front of the press, a compressed air supply at 80 to 100 lb. per sq. in. being required for this purpose. A shoe brake is fitted, which comes into operation when the slide is approaching the top position, and this is automatically released when starting the press.

Drive is by a 50-h.p. motor, running at 720 r.p.m., which is adjustably mounted at the back of the left-hand arm. Transmission is through V-belts to the top friction disc shaft, which runs at 110 r.p.m., and by an extension shaft from the opposite end of the motor through reduction gearing and V-belts, to the lower return friction disc at the right-hand side of the press. The friction wheel is an annealed, toughened steel casting, fitted with an endless-type leather band, and the friction discs, which are accurately balanced on the driving shafts, are of cast iron. The shafts run in gun-metal bearings and are fitted with ball thrust washers for the operating mechanism. The friction disc shafts are automatically moved to the right or left, so that the discs contact the wheel, causing downward or upward traverse of the slide. The slide makes a maximum of eight downward strokes per minute. The approximate weight of the press is 30 tons. [2580].



1,000-ton Friction Screw Press.

the uprights and slide guides are 35 and 28 in. respectively.

The main frame is a one-piece steel casting, and this is mounted on a cast-iron baseplate. The 15-in. diameter pressure screw is of nickel-chrome steel, and the slide comprises an annealed, toughened steel casting. Adjustable guide strips are fitted for taking up wear and to enable the slide to be accurately set. The height from the T-slotted table to the bottom of the slide guides is 19 in., and the height to the slide in its top position is 44 in. The table measures 34 in.

SPECIAL NOTICE TO READERS

To receive prompt attention, address all inquiries to Box 1687, G.P.O., Sydney.

Cut

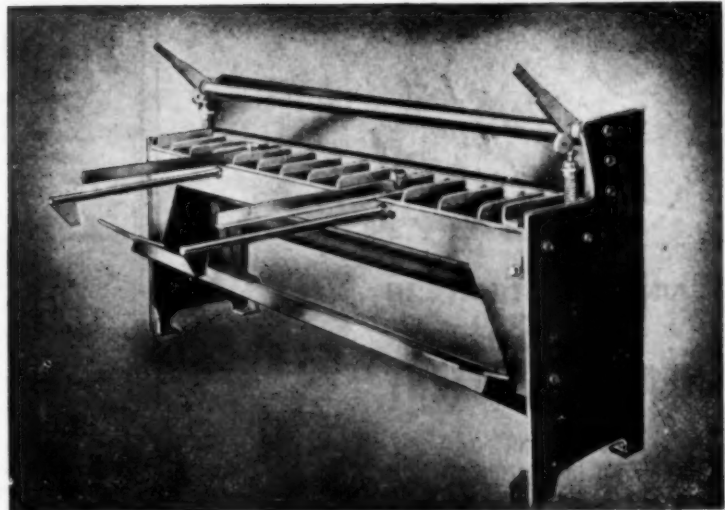
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An essential tool for Motor Body Builders, Sheet Metal Workers, Plumbers, etc., this machine cuts all gauges of sheet metal up to 16-gauge, is fitted with clamping-down bar—a feature possessed by no other 3ft. or 4ft. machine—also front and rear gauges specially adjustable with fine screw adjustments. Long life is assured by freely employing removable bronze bushes in construction, and high tensile bolts and set screws. Easy foot pedal operation is provided, and the table moves backwards and forwards to facilitate adjustment of knives.

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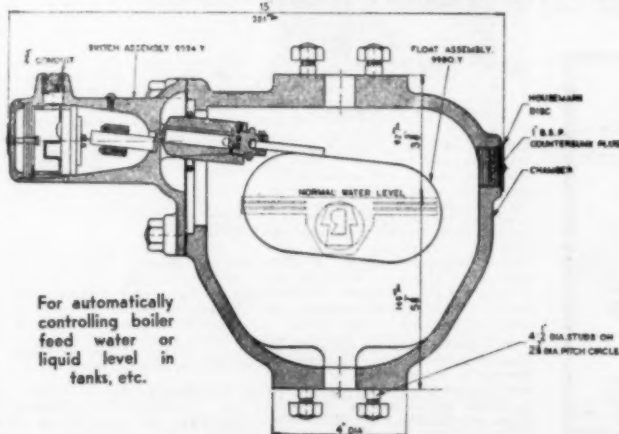
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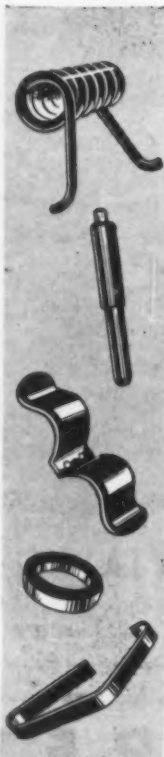
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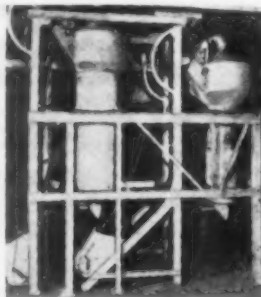
Compact Unit for Sand Reclamation

The new sand decarbonizer, illustrated below, is designed to supply reclaimed sand of physical characteristics equal to new sand. It is a batch unit governed by a timer for continuous operation.

The unit is said to deliver an 800-lb. batch of sand every 12 minutes. The used sand is charged into the bucket loader at extreme left in the photograph, which starts the automatic cycle by dumping the sand into the reaction chamber. Air at approximately 1,700 deg. F. is introduced

foundry. Included in the unit are two dust collectors—one for the reaction chamber and the other for the cooler. A control panel with push-buttons for manual operation is supplied. Oil or gas may be used to heat the air used in the reaction chamber. [2574].

New Instrument for Conductance Measurements



New sand decarbonizer.

into the chamber through a central tube and enters the sand at the bottom. The permeation causes the sand to "boil," allowing very intimate contact between the sand and the heated air. Carbonaceous materials are burned off, and the scrubbing action also assists removal of waste. Sand is discharged through a valve at the bottom of the reaction chamber into the waiting bucket loader at lower left centre of the photo.

This loader elevates the sand to the cooling chamber, which is similar in construction to the reaction chamber in that cooling air is forced down through a central pipe, permeating the sand. The clear, processed sand then is discharged ready for re-use in the

foundry. Included in the unit are two dust collectors—one for the reaction chamber and the other for the cooler. A control panel with push-buttons for manual operation is supplied. Oil or gas may be used to heat the air used in the reaction chamber. [2574].

A new conductance bridge provides a very convenient and sensitive means for indicating chemical or concentration changes in a wide variety of industrial processes. For example, among its varied applications may be included the measurement of sodium hydroxide content in industrial solutions; the routine checking of the alkali content in washing solutions; conductivity measurements on distilled water, boiling water condensate, etc.; conductometric filtrations; and the determination of soil acidity or alkalinity. The instrument is also of great value for determining the concentration of brines, and for many other laboratory and factory tests which have to be carried out for routine monitoring purposes. It offers wide scope for such tests in brewing, electro-plating, power plants, market gardening, and in chemical, textile, sugar and soft drink manufacture.

This new instrument is basically a modified Wheatstone Bridge operating at a test frequency of 2.9 Kc/s. The balance is obtained by means of a precision potentiometer and is indicated by a "magic eye" operated via an electronic amplifier embodied in the instrument.

For ease of operation and reading, a stand is provided for mounting the instrument on a bench in an inclined position. [2510].

Your trouble is here...

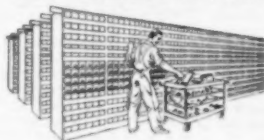
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5 to 1 up to 60 to 1 are obtainable.

The Worm and Wheel are housed in a strong cast-iron casing of neat design, which affords rigid support to the gears and bearings, and also forms an oil bath giving adequate lubrication. The unit is constructed to withstand the usual overloads, and the shafts and bearings are designed for overhanging loads. The bearings can be interchanged to give any desired arrangement of output shaft. The system of ribbing adopted on the casing ensures rigidity, as well as providing for dissipation of heat. The joints are oil tight and the various holes are bored and drilled in jig, ensuring accuracy and interchangeability.

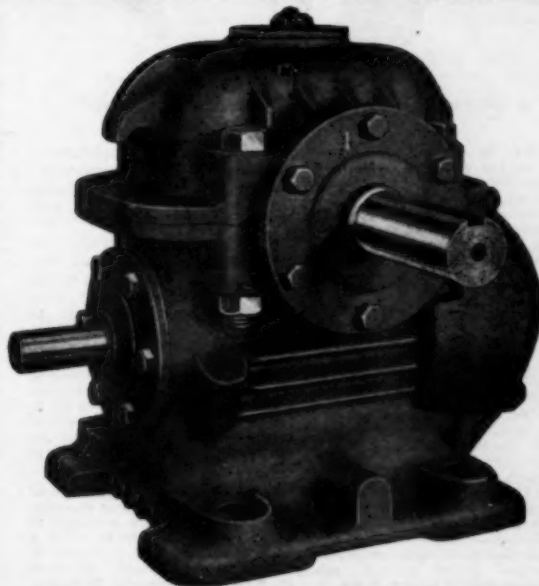
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Motor Travel Section for Hoists

Monosteel Production Features Regulated Travel Speed and Increased Efficiency

For many years now, Monosteel has been a name of considerable significance to the manufacturing industries of Australia by reason of the Hi-lift Silent Electric Hoists bearing that name, which have been admitted as vital factors in materials handling systems throughout the Commonwealth.

Now Monosteel have made a bid for even greater customer satisfaction with the introduction of a motor travel section for attachment to their custom built hoists which promises to ensure accurately controlled travel and maximum efficiency in modern handling practice.

THE most common hoisting device is man, inefficient though he may be and subject to many mechanical troubles not easily repaired. That is why in every modern plant a continuing effort is made to assist man with more efficient and reliable labour-helping mechanical devices. Some of these may relieve him of onerous operations or simply aid and multiply his efforts.

existed and marred the performance of other makes, and the ensuring of maximum headroom with installations.

The successful design they achieved and put into production at their factory in Gross Street, Glebe, N.S.W., enables the hoist to reach remarkably close to the overhead supporting beam. This Monosteel feature eliminates the need to provide high ceilings

tion even under the most arduous duties is therefore eliminated.

This accurate, rigid, all-welded construction is a feature of the new motor travel section which, when bolted to the hoist, combines with it to form a unit of carefully designed and maintained accuracy.

A standard motor of Australian manufacture, fitted with ball races, is used for all Monosteel hoists and travel sections. The motor can be replaced within a few minutes in the event of motor failure due to unavoidable circumstances, thereby obviating any serious delay in handling time. The necessary reduction is achieved by a worm and wheel unit, in which British Standard Gear Assn. formulae are the basis of design.

The worm wheels are of spun bronze with accurately generated teeth. The worms are of nickel chrome steel, hardened and ground finished to the finest limits. Gears are housed in a totally enclosed gearbox and run in a bath of heavy oil, eliminating friction and ensuring perfect lubrication.

Power propulsion in the motor drive section is effected by worm gear reduction drive from electric motor through spur gears. All track wheels are fitted with ball bearings and are mounted in the channel of the hoist and travel section, gaining valuable inches of head room; the spacing of the track wheels enables the hoist to sit rigidly on the overhead beam under the worst conditions.

Where a hoist is required to negotiate curves it is equipped with swivelling bogies for this purpose. In the Monosteel design the king pins merely centre the load and carry no load whatsoever.

The winding drum, of a diameter adopted to prolong the rope life, is of closely grained grey iron and is deeply grooved to control the rope under all circumstances. The ropes are of galvanised steel wire of 6/19 or 8/24 construction with a minimum of 1 inch circumference except in the case of the 750 lb. capacity hoist. The load hook is of trapezoidal section, steel forged and mounted on a ball bearing swivel.

The brake is a standard magnetic type, solenoid operated, and liberal retarding torque is provided for all eventualities. The solenoid is energised only while

the hoist is working. In the event of current failing the brake is applied automatically.

Top and bottom limit controls are provided whether the hoist is operated by a pull cord or push button control. Either mechanical or electrical limit controls used can be set to provide for any limits desired to prevent over-run. The modern electric hoist is an outstanding mechanical device that has qualified for a prominent place among industrial equipment to lighten the task of man, eliminate time waste and in these strenuous days add its contribution to the speeding up of production by its remarkable non-stop performance.

Monosteel's progression in this field is of high order, and looks to be enhanced by the introduction of the motor travel section.

While the company's standard hoists are listed as ranging in lifting capacity from 750 lb. to 12,000 lb., their practice of building to customers' requirements is developed so successfully and to such a degree that it is not proposed to quote relevant figures



A Monosteel Hi-lift Hoist, with the new Motor Travel Section attached.

Of the latter, the block and tackle is the simplest, consisting of an arrangement of ropes, pulleys and pulley blocks.

At the other end of the scale is the modern electric hoist, said to have a far wider application than any other type where high speeds are required for economic operation.

Electric hoists may be operated as simple lifting and lowering devices or mounted in a number of ways to extend their usefulness. When the hoist is supported on a plain trolley it is moved with its load by a pull or push on the load or hoist hook. For fast travel and maximum efficiency, motor driven trolleys are recommended.

It is this latter feature that Monosteel have introduced to their Hi-lift hoists and which promises to enhance the reputation won by their original product.

When Monosteel engineers undertook the design of an all-Australian electric hoist that would be immediately acceptable to industry, they considered the main problems were the elimination of certain weakness which they felt

for hoist operation in industrial buildings. It is a feature which has appealed immediately to users and establishes a decided preference with intended purchasers.

Apart from this, perhaps the most popular feature of the Monosteel production is that the units are custom built; that prospective users are able to submit their individual problems concerning capacity, lifting speed, height of lift, etc., and receive prompt quotations for a Monosteel hoist which, while modified to meet these requirements, adheres faithfully to the basic structural features which have earned for these units a prominent place in industry.

The electrically welded steel chassis of the unit creates stability. Structural rigidity is essential to withstand the stresses to which a hoist is subject. For structures of this character stresses of 18,000 lb. p.s.i. are allowable. Monosteel Hoists have been stressed by the designers, and it was found that no portion of the structure exceeds 10,000 lb. p.s.i. The risk of deflec-



Compact, sturdy design featured in Monosteel Hoists, is found also in the Motor Travel Section, illustrated above.

regarding capacities within that range but rather to refer the reader to the executive office of the organisation, Monosteel Electric Hi-lift Hoists, at 24 Bond Street, Sydney, from which he can obtain full details of an electric hoist to meet the most exacting demands of his materials handling department.



"Coolmaster" Model CMC 20 Evaporative Ammonia Condenser.



"Coolmaster" in a large cold storage plant.

Industrial Water Cooling

Remarkable Economies Achieved by "Coolmaster" Equipment

Figures show that some remarkable economies are being achieved by the installation of "Coolmaster" Evaporative Coolers wherever large quantities of water are required to be cooled for heat dissipation in industry.

Designed and manufactured by Wembley Engineering and Refrigerating Company Pty. Ltd. in their up-to-date factory at 553-555 Church Street, Richmond, Victoria, these units have been installed in leading factories throughout the Commonwealth for cooling water used for internal combustion engines, in heat treatment plants, for dissipating heat generated in breaking down electric current to normal voltages, for cooling doors of heat-treatment furnaces, for re-cooling oil used in quenching and tempering steels, for cooling process water in food canning plants, etc.

For all these purposes and for many more too numerous to mention, "Coolmaster" Evaporative Coolers have proved superior over other forms of cooling, while economies achieved in cases where water was previously allowed to run to waste are capable of returning the initial outlay in the first year of operation.

THE wide range of modern industries which require quantities of cool water to control various phases of manufacturing is increasing steadily and, while it was once usual to obtain almost unlimited quantities of cheap, cool water by pumping from nearby rivers, ponds or wells, modern developments have for some time precluded this form of water supply to factories, particularly for those situated in growing cities.

Water must now be drawn from city supply systems and after use is emptied into municipal drains.

Not only has water become expensive to buy in large quantities, but most local authorities also make a charge on the estimated effluent rate into sewers—thereby doubling the economies which may be achieved by installing self-contained water cooling systems which return the water to normal temperature and allow it to be used again and again with only minor losses caused by evaporation.

While the expression "money down the drain" will be seen, therefore, to have taken on new significance, the very considerations of economy which make the installation of cooling equipment mandatory for present day industry also call for careful attention to be given to the most efficient, convenient, and economical means to be adopted.

When rising costs and water restrictions first made it necessary to cool and recirculate water, the usual type of plant to be adopted was the natural draught cooling tower where water was stored, recirculated, and cooled, by evaporating in the atmosphere a small quantity of the circulated water.

Natural draught coolers, however, in addition to requiring the erection of large towers built from materials now difficult to obtain, possess many disadvantages. In addition to the high percentage of wind losses and the nuisance of water shed on their surroundings,

the wood and iron used in their construction is particularly liable to disintegration by rot and rust, necessitating constant maintenance and frequent replacement.

Where large quantities of water have to be cooled, extensive towers must be provided which take up much valuable space and make additional maintenance necessary to surrounding structures which seldom get a chance to "dry off" owing to the continual presence of water droplets in the air.

As these towers depend on natural draught to produce the cooling effect, they are relatively inefficient on windless days and great difficulties are experienced during hot humid weather, the lack of evaporative capacity of the air failing to produce the desired cooling effect just when it is likely to be required most.

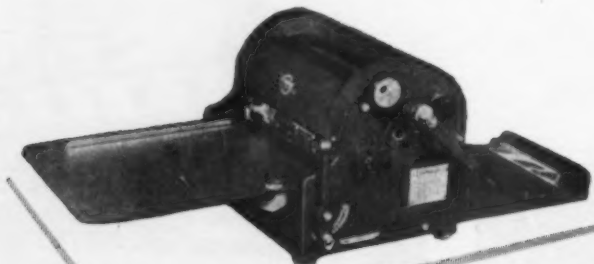
To overcome these shortcomings of natural cooling systems, Wembley Engineering and Refrigerating Company Pty. Ltd., with years of

experience in the design and manufacture of evaporative water cooling plants, have developed the "Coolmaster" Evaporative Cooler.

The performance of an evaporative cooler is governed by the ability of the air to absorb water vapour and increase its relative humidity up to saturation point. This factor, expressed by the difference between wet-bulb and dry-bulb thermometer readings, ensures that the drier the air the more moisture it will absorb, and the faster the movement of the air the more heat it will remove.

The "Coolmaster" employs this principle; the water being atomised by the sprays, gives up its latent heat of vaporization to the current of air passing through the cooler, until the air reaches saturation point.

Economic cooling by employing this principle is guaranteed within a range of 40°F.—which is usually sufficient for general industrial applications, especially where eva-



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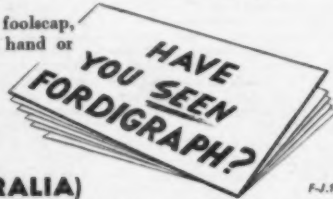


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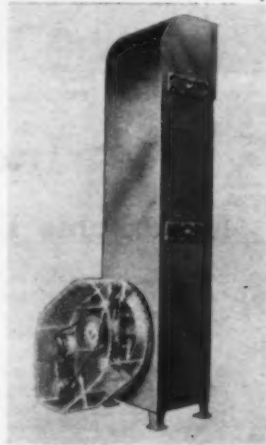
F-1

porative coolers are being installed to replace heat exchange equipment previously dependent on town supply, bore, river, or pond water.

Manufactured entirely from mild steel plates and sections fabricated by electric welding, all parts of the "Coolmaster" which are subject to corrosion are treated by special anti-corrosive processes or manufactured of non-ferrous materials. All surfaces are treated with a coating of inorganic zinc combined with a protective element resulting in a protective coating resistant to corrosive attacks to a degree hitherto impossible with painted surfaces.

All essential parts are readily visible and accessible for cleaning or adjustment where necessary. The possibility of blockage and lowered efficiency due to the building up of the deposits of corrosion has been entirely eliminated by this means, thus contributing added economy of operation.

As the "Coolmaster" requires only sufficient water to fill its small



"Coolmaster" developed for plastics manufacturers.

reservoir and the piping to the installation to be cooled, a saving of up to 95 per cent. of water usually wasted is possible. The only additional water required is for the replacement of limited evaporation from the entirely leak and splash-proof system.

The design of the "Coolmaster" includes one or more fans, a number of spray nozzles and eliminator plates which prevent excessive loss of water in the discharge air stream and—when used as a condenser—a condenser surface made in the form of a coil of standard pipe.

It is usually necessary to embody slight modifications in the design of the main components to comply with the requirements of each application and the technical staff of Wembley Engineering and Refrigeration Company Pty. Ltd. are always ready to advise on the

(Turn to page 32.)



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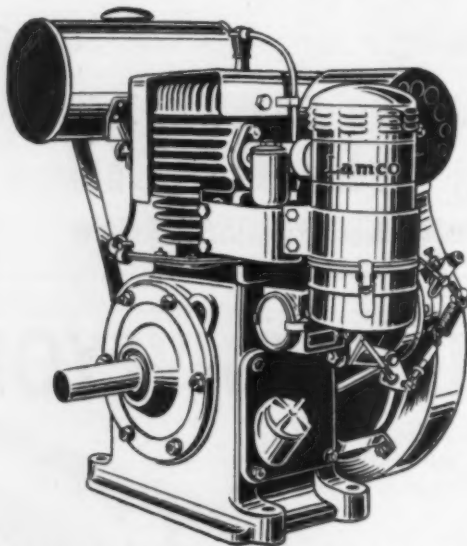
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(Continued from page 30.)

best adaptations for each purpose.

The functional operating features, however, are identical in every case with units of small capacity operating under forced draught and water pump driven from the same electric motor, while the larger capacities operate under induced draught with fan and water pump driven by individual electric motors.

Supplied in 25 stock models with a water cooling capacity of from 200 to 20,000 gallons per hour, the "Coolmaster" may be custom built to fulfil special requirements or coupled together to provide multiple units capable of handling any given quantity of water.

The "Coolmaster" system, with its greater degree of cooling to a constant temperature, achieves greater efficiency throughout plants wherever it is installed. Reduced temperatures impose less wear on equipment ensuring safe operation and a corresponding drop in horsepower required to drive plant. When used in conjunction with heating equipment the constantly lower temperatures achieved permit regular production at all times under varying conditions.

Principal applications comprise Refrigerant Condensing, Compressed Air Inter- and After-cooling, Oil Cooling, Gas Cooling, Cool Room Unit Cooling, Water Cooling and Air Conditioning.

A typical larger type of installation is that recently completed for O.T. Limited at their food processing plant at Bendigo. Of 36,000 gallons capacity per hour, this cooling plant consists of five units coupled in line and extracts 11,000,000 British thermal units per hour from the cooling water used in canning.

If allowed to run to waste the cost of water saved by this unit running two shifts would be £7,500 per annum at normal city rates, supposing this quantity to be available and ignoring any effluent rate which would be additional. As the cost of such a plant is in the vicinity of £5,000 and operating costs are under £1,000 per annum, it will be seen that under these conditions it would more than pay for itself the first year.

While these may seem to be unusual circumstances, the savings achieved by hundreds of firms throughout the Commonwealth in installing plants to eliminate wastage of water or to replace inefficient cooling equipment, are no less important for being less dramatic in their impact.

Economies achieved in the low operating costs of the "Coolmaster", plus savings in water wastage over the most efficient natural draught cooling systems, represent a valuable contribution to the reduction of manufacturing costs in Australia.

With the probability of a buyers' market developing at home in the not too distant future, and with Australia already competing with the world market in many countries, considerations of cost and operating efficiency are entering

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(Turn to page 34.)

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ONE—Mather & Platt Pump, 18in. Suction, 16in. Delivery, capacity 6,670 g.p.m. at 30ft. head, driven by 84 h.p. 400 volt 3 phase 50 cycles squirrel cage motor by Mather & Platt, 730 r.p.m. with auto-transformer Starter.

ONE—Gwynne "Invincible" Pump, 8in. Suction and Delivery, capacity 1,250 g.p.m. at 25ft. head, driven by 20 h.p. 400 volt 3 phase 50 cycles squirrel cage motor by Crompton Parkinson.

ONE—Mather & Platt 2-stage Pump, 9in. Suction, 7in. Delivery, capacity 900 g.p.m. at 185ft. head, direct coupled on bedplate to 80 h.p. 400 volt 3 phase 50 cycles squirrel cage motor by Mather & Platt, 1,440 r.p.m., with Star Delta Starter by Allen West.

FOUR—Unused Holden & Brooke Turbine Pumps, 5in. Suction, 4in. Delivery, capacity 100 g.p.m. at 200ft. head, mounted on bedplate and direct coupled to 15 h.p. 400 volt 3 phase 50 cycle squirrel cage motor by Alpha Harris, 1,450 r.p.m. with Star Delta Starter.

SIX—Holden & Brooke Pumps, 6in. Suction, 5in. Delivery, capacity 400 g.p.m. at 104ft. head, driven by 30 h.p. 400/440 volt 3 phase 50 cycles squirrel cage motor by Met. Vickers, 1,470 r.p.m. with Star Delta Starter.

TWELVE—Unused Bryan Donkin Pumps, capacity 50/85 g.p.m. at 85/45ft. head, direct coupled on bedplate to 4 h.p. 400 volt 3 phase 50 cycle totally enclosed squirrel cage motor by G.E.C.

TWO—New Harland Pumps, type SNC 1½, 2in. Suction, 1½in. Delivery, capacity 86/144 g.p.m. at 180/120ft. head, driven by 15 h.p. 400 volt 3 phase 50 cycle squirrel cage motor by Flather, 2,950 r.p.m.

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TWO—Unused Diesel-driven Pumping Sets, incorporating horizontal Duplex Ram Pump by Gardner-Denver, model FXKM, capacity 360 American galls. per minute, at 1,380ft. head, direct coupled through gear-box to 226 h.p. 6-cylinder Waukesha Diesel Engine, Model 6 MKH.

THREE—Unused horizontal two-throw Ram Pumps by Dawson Downey, rams 5in. diameter by 8in. stroke, capacity 110 g.p.m. at 575ft. head, "V" belt driven from 24/48 h.p. petrol engine by Morris.

FIFTEEN—Unused vertical three-throw Ram Pumps by Lee Howl, rams 4in. diameter by 4½in. stroke, capacity 42 g.p.m. at 300ft. head, alternatively 50 g.p.m. at 100ft. head, 3in. suction, 2½in. delivery, "V" belt, driven from 10 h.p. squirrel cage motor by Brook, 1,450 r.p.m. with Star Delta starter.

FIFTEEN—Unused vertical three-throw Ram Pumps by Lee Howl, rams 4in. diameter by 4½in. stroke, capacity 42 g.p.m. at 300ft. head, alternatively 50 g.p.m. at 100ft. head, 3in. suction, 2½in. delivery, "V" belt driven from 10 h.p. Potter Diesel Engine.

ONE—Horizontal two-throw Ram Pump by Hayward Tyler, 4½in. suction and delivery, capacity 200 g.p.m. at 320ft. head, direct driven through gearing from 25 h.p. 415 volt 3 phase 50 cycle Slipring Motor by Met. Vickers, 828 r.p.m.

ONE—Vertical Geared Driven Ram Pump by Tangye, Rams 4in. diameter by 6in. stroke, 2½in. suction and delivery; capacity 50 g.p.m. at 58ft. head, driven by 5 h.p. 400 volt 3 phase 50 cycle squirrel cage motor by Brook, with Star Delta starter.

FIVE—Belt-driven Single Cylinder Ram Pumps by Joseph Evans, 1in. suction and delivery, capacity 12 g.p.m. at 150ft. head, driven by 2 h.p. 400 volt 3 phase 50 cycle squirrel cage motor by Brook with Star Delta starter.

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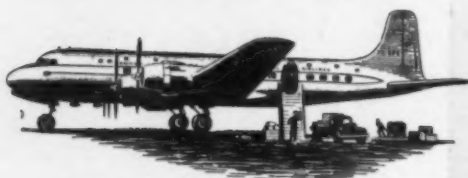
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(Continued from page 32.)

more and more into long range production programmes.

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It is proposed that the text of
the three Standards be adopted
as they stand, but that in each
Specification nickel content be
limited to 0.10 per cent. in Aus-
tralian conditions, that the title
of B.S. No. 1172 be endorsed to
read "Copper for General Pur-
poses, including Welding", and
that a note in the following terms
be appended to each of the
Specifications as endorsed for
Australian use:

"The selenium and tellurium
specified is far in excess of
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factory welding. The toler-
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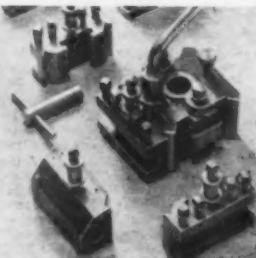
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ELECTRICAL ACCESSORIES AND ARTIFICER'S TOOLS: New Zealand manufacturer of Electrical Radio and Wiring Accessories and also Artificer's Tools, will shortly visit Australia with the object of contacting firms who may be interested in his Company's products. Organisations interested in this inquiry are asked to write to Ref. 8273, c/o "The Australasian Manufacturer."

FILTERS AND FILTER APPARATUS — MANUFACTURING OPPORTUNITY: European manufacturer of Filters and Filter-Apparatus for Gases and Liquids, is prepared to grant manufacturing rights to an Australian manufacturer under very attractive conditions. If interested, write to Ref. 8266, c/o "The Australasian Manufacturer."

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True to Specification.

Silicate & Dolomite Co. of Aust.
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TAIL-BOARD HOISTS: Tasmanian firm desires to contact an Australian manufacturer making a Tail-board Hoist, particularly for handling heavy and awkward loads, the hoists to be driven from a power take-off. Write to Ref. 8269, c/o "The Australasian Manufacturer."

MANUFACTURERS — S. A. REPRESENTATION: An established firm of Importers and Merchants is desirous of expanding their Australian connections, and wish to contact Australian Manufacturers who are not satisfactorily represented in South Australia. All types of merchandise required, especially Hardware, Machinery, Chemicals, Food products and by-products, Piece goods, etc. Write Ref. 8268, c/o "The Australasian Manufacturer."

NON-CORROSIVE BALLS WANTED: Sydney firm wants to buy supplies of non-corrosive balls 3/16 in. diameter—phosphor bronze or stainless steel—up to 30 gross required. Write to Ref. 8267, c/o "The Australasian Manufacturer."

MACHINE TOOLS WANTED: Sydney manufacturing company wishes to purchase the following machines: 10 ton Power Press, Hand Screw Presses, Surface Grinder, Universal Miller, and a Pedestal Drill to take up to 1 1/2 in. drills. Machines must be in good condition. Ref. 8261, c/o "The Australasian Manufacturer."

ELECTRIC VIBRATORS FOR MASSAGE PURPOSES: New South Wales or Victorian makers of Electric Vibrators used for massage purposes are asked to write to Ref. 8264, c/o "The Australasian Manufacturer."

MATERIAL AVAILABLE (RESISTANCE RIBBON, NICHROME WIRE, NICKEL NUTS): Brisbane firm has available at attractive prices, the following material: Approx. 40 lbs. 1/32 in. x .005, 50 lbs. /132 in. x .003 Kanthal D Resistance Ribbon; approx. 2,000 pure nickel nuts, 3/16 in. hexagon; approx. 100 lbs. 26 B. & S. 80/20 nichrome wire. Write to Ref. 8265, c/o "The Australasian Manufacturer."

(Turn to page 39.)

FOR ALL TUBE AND PIPE BENDING PROBLEMS

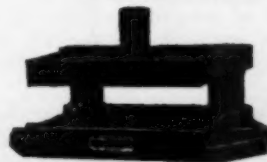
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Melbourne, Adelaide and Perth: McPherson's Ltd.

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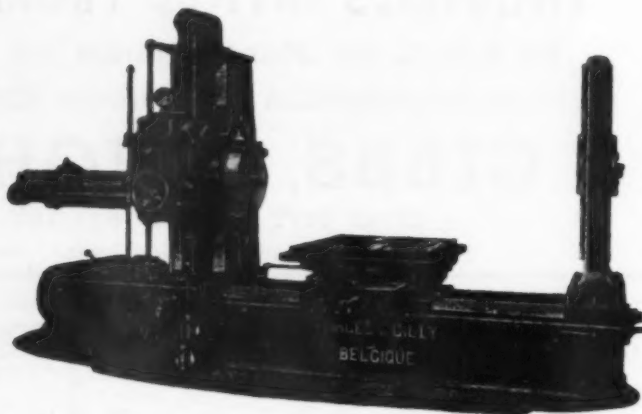
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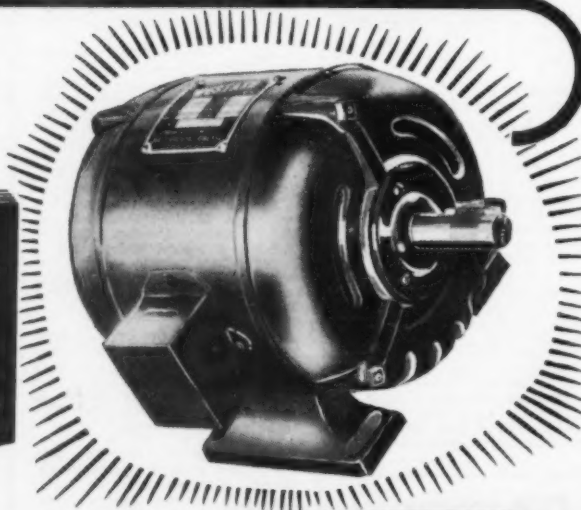
One 3½in. machine is available for immediate delivery.

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(Continued from page 37.)

**MANUFACTURE OF MEDICAL
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GOODS AND RUBBER TOYS:** A
Dutch firm which manufactures
medical, surgical and domestic
rubber goods and rubber toys
wishes to engage in the produc-
tion of such commodities in Aus-
tralia, and is interested in part-
nership or other form of business
association with a similar existing
establishment in this country.
Firms interested in this inquiry to
write to Ref. 8263, c/o "The Aus-
tralasian Manufacturer."

LEAD LADLES: Manufacturers
of Lead Ladles are invited to
communicate with Ref. 8262, c/o
"The Australasian Manufacturer."

STEEL TUBING WANTED: If
you can supply two or three hun-
dred feet of 1½ in. steel tubing, 17
Gauge, in lengths 20 in. (or
multiples of 20 in.) write to Ref.
8250, c/o "The Australasian Manu-
facturer."

CADMIUM METAL WANTED:
Sydney firm wants to buy Cad-
mium Metal and Residues. Write
to Ref. 8260, c/o "The Aus-
tralasian Manufacturer."

LATHE WANTED: Queensland
firm desires to purchase a sliding,
surfacing and screw cutting Bed
Lathe, 7½ in. or 8 in. Write to Ref.
8257, c/o "The Australasian
Manufacturer."

DIESEL ENGINES WANTED:
If you can supply, for export,
Diesel engine generating sets,
5,000 Kv-A and larger (preferably
used), write to Ref. 8253, c/o "The
Australasian Manufacturer."

**SCIENTIFIC GLASSWARE —
AGENCY AVAILABLE:** West
Australian firm manufacturing
Scientific Glassware for Labora-
tory, Medical and Industrial pur-
poses, desires to appoint a reliable
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**FRICTION TYPE SCREW
PRESS OR DROP HAMMER
WANTED:** Sydney firm requires
a Friction Type Screw Press,
80 ton blow, or an automatic or
semi-automatic Drop Hammer of
similar capacity. Write to Ref.
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QUEENSLAND:** A well established
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etc. Please apply in writing,
stating details of business, indus-
tries already covered, etc., to Ref.
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GARFIELD AUTOMATIC NUT TAPPERS



No. 0

Auto. Tapper

Capacity ½" - ¾"

Production
(approx.)

¼" 4,900 Per Hour
⅜" 4,000 Per Hour

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Capacity ¾" - 1"

Production
(approx.)

¼" 3,000 Per Hour
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RESEARCH SCHOLARSHIPS.

**VACUUM OIL COMPANY'S
ASSISTANCE TO INDUSTRY.**

For research in the fields of chemistry, chemical engineering, or mechanical or mining engineering, scholarships worth £500 a year have been made available at the Universities of Melbourne and Sydney by the Vacuum Oil Company Pty. Ltd.

In Melbourne recently the Chairman and Managing Director of the Vacuum Oil Company (Mr. Harold Rabling) said his Company was anxious to assist Australian Universities in developing research workers not only outstanding in particular fields of research, but having the potential all-round ability to later assume executive responsibility in industry.

Australia could well do with men able to couple good academic achievement with the general ability to rise in industry to executive positions and, with this in mind, Mr. Rabling said he would like to see selected for the scholarships, men with potential all-round ability rather than with a purely academic outlook.

The Vacuum Oil Company Research Scholarships would be open to engineering and science graduates of any Universities in Australia, but research work under the scholarships was to be carried

out at either Melbourne or Sydney Universities, he said.

The scholarships would be awarded in February each year from applications lodged with the Registrar of either University by the preceding December 15. Selection of scholarship winners would be made by the Professorial Board of each University, on the recommendation of a committee consisting of the Professors of Chemistry, Chemical Engineering, Mechanical Engineering and Mining Engineering, and a representative of the Vacuum Oil Company Pty. Ltd.

Mr. Rabling said scholarship holders would be given the right to publish the results of their research.

**NEW INDUSTRIAL FINANCE
COMPANY.**

With a nominal issue of 4,000,000 £/- ordinary shares, a new finance Company, Mainguard (Aust.) Ltd., has been formed in Sydney. Of these shares 2,400,000 have been applied for by directors and their associates and the remaining 1,600,000 shares will be offered to the public, probably early in October.

The company's activities will be restricted chiefly to issuing business, especially in new capital for industry and local authorities, and for both private and public corporation. Chairman is Sir Alfred Davidson.



PRESSED STEEL WINGNUTS

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Threads cut in cold drawn steel of high hardness, with superior resistance to wear and tear.

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G.E.C. GERMANIUM CRYSTAL RECTIFIERS.

Four types of germanium crystal rectifiers for use in electronic circuits, indicating instruments, telephone apparatus, etc., have been introduced by The General Electric Co. Ltd., and are available for immediate delivery. The rectifiers are very small in size, have low forward impedance and are designed to be soldered directly into a circuit so that no mounting or support is needed. Their life is indefinitely long and should be not less than that of equipment in which they are used.

In this type of rectifier, as distinct from silicon rectifiers, the outstanding advantage is the ability to withstand comparatively large voltages in the reverse direction, while maintaining a forward current (measured at +1 volt.) corresponding to a conductance of 10 mA/volt.

The slope in the reverse direction reaches a maximum value at about 2 volts. Beyond this the resistance falls slowly until at a particular voltage, known as the "turnover voltage" the slope falls to zero and then becomes negative.

Measurements of rectification efficiency at frequencies up to 100 Mc/s show that the efficiency falls with increasing frequency by an amount dependent on the turnover voltage; the higher the turnover voltage the lower the rectification efficiency. Because of this, crystals for use at the higher frequencies have a maximum and minimum "turnover voltage."

An important feature of G.E.C. germanium rectifiers is their remarkably high electrical and mechanical stability when subjected to shock or vibration. This

is due to the junction between the metallic point and the crystalline germanium being treated during manufacture to obtain the optimum rectification characteristics and time stability. Afterwards the metal point is cemented to the germanium to prevent dislodgment by vibration. The

whole is then sealed into a tough glass envelope with wired ends. Colour coding is used to designate the four standard types of rectifiers.

All types will withstand a continuous forward current of 30 mA and a recurrent peak of 100 mA. There is little change of rectifier

characteristics with temperature for the range 15 deg. C. to 50 deg. C., but between 50 deg. C. and 100 deg. C. the forward and reverse resistances decrease slowly with increasing temperatures.

The G.E.C. is represented solely in Australia by The British General Electric Co. Pty. Ltd.

The late D.Sc., Dr. Whyted,
When questioned below was delighted.
Heat treatment preferred?
He blandly demurred
"But Cassel, of course", and ignited.



The effectiveness of all "Cassel" Brand Heat Treatment Salts is the result of wide experience and exhaustive testing under operating conditions. Take advantage of the technical service designed to assist you in their use. Contact your nearest I.C.I. branch for complete information.

"Cassel" Brand HEAT TREATMENT SALTS

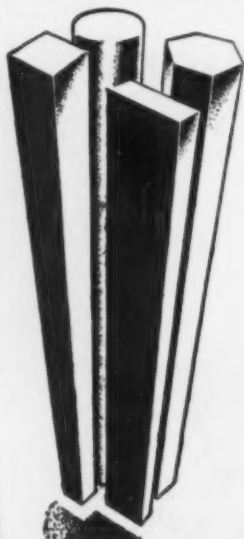
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"MARBRITE" BRIGHT STEEL is manufactured in completely modern plant, to standard specifications, from specially prepared raw materials.

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The following classes and grades are standard:

BRIGHT MILD STEEL —

- GRADE 1 — Shafting.
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- EXTRA SUPER — Freecutting.
- LEADER — Freecutting for specialised purposes.
- GRADE CH2 — Case hardening.

PRECISION GROUND —

Supplied in all "Marbrite" Grades, to Standard or Special Tolerances.

BRIGHT ALLOY STEELS —

- "MARBRITE" L5 — 3 per cent. Nickel — Case Hardening.
- "MARBRITE" Q6 — Nickel Chrome — Case Hardening.
- "MARBRITE" L10 — Nickel Molybdenum — Case Hardening.
- "MARBRITE" Q7 — Nickel Chrome — High Tensile.
- "MARBRITE" R4 — Nickel Chrome Molybdenum — High Tensile.

AIRCRAFT STEELS —

To Standard Specifications

"MARBRITE" Rounds, in Grade CH2 and other suitable grades, can be supplied oversize to provide for grinding, after heat treatment.

Special Sections — A comprehensive range is available against order.

Precision ground bars are manufactured to Standard tolerances with a wide range of Round sizes from 1in. to 8in. diameter. Table A tolerances are within +.000—-.002 down to within +.00025—-.00025.

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BRIGHT STEELS**

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MARINE PLYWOOD.

The Standards Association of Australia announces the issue for public review and comment of a Draft Australian Standard Specification for Marine Plywood to include both standard and marine grades (Document 156).

In order to meet the requests of various organisations concerned with the use of water-proof plywood, a standard grade has been inserted in addition to the marine grade, which is the highest quality and in which mechanical strength and imper-

fections permitted in the timber are strictly specified.

The water resistant qualities of the adhesive to be used are set down as essentially the same for both grades of plywood.

The standard grade permits a lower quality of timber, particularly in the inner plies, though

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Est. 1859. Tel.: MX 2118.

still retaining a water-proof glue line. Plywood of this type is intended for general application when stress considerations are not important, whereas the marine grade is intended for applications involving stressing of the plywood.

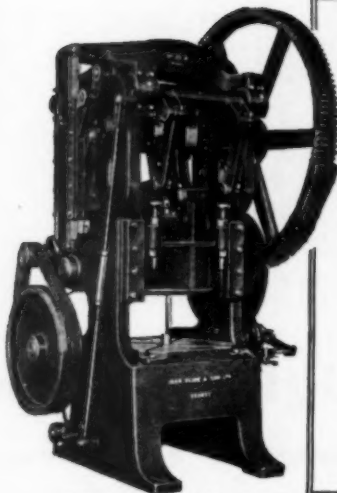
The Draft Specification has sections dealing with general provisions, including definitions, dimensions, thickness and tolerances, adhesives; marking and storage; waterproof plywood marine grade, special requirements; and waterproof plywood standard grade, general requirements; and testing.

Copies of the Draft Specification can be obtained from the Standards Association of Australia, Science House, Gloucester Street, Sydney, or from branch offices in all capital cities of the Commonwealth and Newcastle, N.S.W., to which addresses, also comments, on the Draft should be sent not later than the 31st October.

U.S. GOODS UNDER 100 MILLION DOLLAR LOAN.

Senator N. O'Sullivan, Minister for Trade and Customs, has listed the products which Australian manufacturers and importers will be able to secure from the United States under the terms of the recent 100 million dollar loan. These are:—(1) Tractors and other agricultural equipment; (2) Industrial crawler tractors and earth-moving equipment; (3) Locomotives and rail cars (including component parts), and ancillary railway equipment; (4) Mining machinery and equipment; (5) Plant for developing the productive capacity of the following industries: Steel, textiles, engineering, electrical engineering, chemicals, building materials, boot-making and shoemaking, food processing, glass-making and working, ceramics, paper-making and paper-working (including printing).

Organisations desirous of importing any of these lines are obliged to submit full details of their dollar requirements to the Administrative Officer, Central Import Licensing Branch of the Department of Trade and Customs, Sydney. All shipping arrangements have to be finalised before December 31, 1952.



85A Series 2 Double Action
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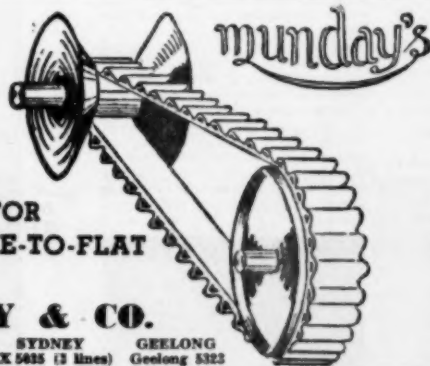
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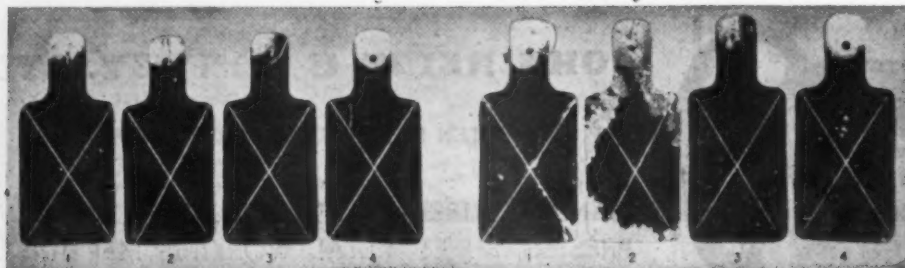
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SERVICE



Advantages of dichromate treatment are illustrated by corrosion tests of these magnesium alloy pieces. (Left), before corrosion testing; Samples 1 and 3 dichromate treated and painted, samples 2 and 4 untreated and unpainted. (Right), after testing; Samples 1 and 2 salt spray tested for 120 hours, samples 3 and 4 constant humidity tested for 120 hours.

Inorganic Finishes for Light Metals

Optimum Corrosion Protection are the Chemical Treatments

Practical considerations such as cost and availability make selection of inorganic coatings for metallic materials quite different than if based solely on theoretical factors such as electromotive potential.

CHOICE of a particular type of inorganic coating for a specific metallic material is based on consideration of both functional aspects and the economic latitude permitted for finishing the product. To make the best choice, the design engineer should become familiar with established coating processes, their relative costs, and their applications.

There are two types of inorganic coatings of importance for engineering applications. Electroplated metallic coatings, and the oxide or chemical "conversion" coatings. These can be applied to the light metals, the copper alloy group, the ferrous group, zinc die castings, and the lead base alloys. Some of the more unusual coating applications will be considered separately.

MAGNESIUM.

A major problem in using magnesium alloys is corrosion prevention. The condensed Electromotive Force Series in Table I shows that magnesium is most chemically active of the structural metals. Metals with a higher electronegative potential have greater chemical activity; thus, when two metals are in contact, the less electronegative is protected by the more electronegative metal, which is "sacrificed."

Table I is a theoretical listing, based on the potential of an electrode of the material in a one molar solution of its ions, referred to the normal hydrogen electrode at 25 C. A more practical series, derived from corrosion data, is shown in Table II. When any two dissimilar metals are in contact, there is some accelerated corrosion of one by the other. However, metals within groups bounded by dotted lines do not corrode each other by galvanic action to any great extent; but metals in groups lower in the table will cause

markedly increased corrosion of metals in groups higher in the table, when both are in contact. Thus magnesium cannot be protected by electroplating with any other metal below it in the series;

even zinc and cadmium, which are most often plated on metals for corrosion protection, are in a group below magnesium.

The only way to adequately protect magnesium from corrosion

Table I—Electromotive Force (E.M.F.) Series

Metal	Potential, volts
Lithium	-2.959
Rubidium	-2.925
Potassium	-2.924
Calcium	-2.76
Sodium	-2.714
Magnesium	-1.8
Aluminium	-1.337
Zinc	-0.761
Chromium	-0.557
Iron (ferrous)	-0.44
Cadmium	-0.401
Cobalt	-0.23
Nickel	-0.20
Tin	-0.136
Lead	-0.122
Hydrogen	-0.00
Copper	0.344
Silver	0.797
Platinum	0.86
Gold	1.36



Pickling a fabricated magnesium dome prior to painting. Chemical treatments increase corrosion resistance and paint adhesion.



Typical magnesium aircraft parts, after chrome pickle treatment for corrosion protection of surface, and as a base for paint. This treatment is simple and inexpensive.



For maximum corrosion resistance, anodized films are best on aluminium. These parts have been finished by the sulphuric acid anodizing process. Such coatings can be dyed, with beautiful, permanent colours resulting.

by electroplating, says Jerome L. Bleiweis in "Product Engineering" is to plate a coating heavy and pore-free enough, which prevents the initiation of galvanic corrosion by complete physical exclusion of the atmosphere. This approach is costly, and is used only when the decorative aspects of the product are important enough to warrant plating. When corrosion resistance is the primary consideration, it is preferable to apply "oxidized" conversion coatings by controlled corrosion of the magnesium surface, forming impervious films that retard further corrosion. For even better corrosion resistance, organic coatings are applied over the oxide finishes.

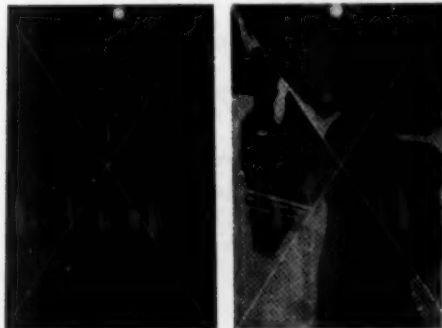
The activity of magnesium under widely different conditions and environments determines the selection of corrosion-retarding coatings for magnesium.

In inland environments, magnesium can withstand the deteriorating effects of corrosion for many years, with little loss in physical properties. Although not quite as good as aluminium in this respect, magnesium forms a fairly impervious "self-healing" oxide coating in inland environments.

Generally, magnesium corrodes more rapidly in coastal or marine atmospheres than in inland areas. Chlorides are particularly severe in their attack on magnesium; prolonged exposure to a salt spray atmosphere results in bulky non-adherent corrosion products. Thus, in saltwater or marine environments, it is advisable to find the best protection for magnesium, regardless of cost. The following procedure is the best solution for this type of problem, with magnesium: First, apply the best oxide coating available; then, apply one or more zinc chromate primer coatings; finally apply a good organic top coat.

Alloys of magnesium do not corrode in solutions of chromates, chromic acid, fluorides, borates, or alkalis under most conditions. Most mineral acids attack magnesium vigorously.

The "conversion" or chemical surface coatings are the most important protective treatment for magnesium. The most widely used chemical treatments for magnesium are the processes utilizing chromates and dichromates as the active coating forming materials. Best known of these are the



Comparative effect of outdoor exposure for 3 months. Aluminium sheet panel at left is phosphate coated (Bonderized) and painted. Panel at right is painted without phosphate coating.

Chrome-Pickle (Dow Treatment No. 1 or AMC Treatment A), Dichromate (Dow Treatment No. 7 or AMC Treatment G), and Modified Alkaline-Dichromate (Dow Treatment No. 8 or AMC Treatment H). Of these, the most inexpensive to operate and prepare, and the simplest and most rapidly applied coating is the chrome-pickle treatment. It is used primarily for corrosion protection on rough castings, sheet, extrusions and forgings during storage, shipment, and machining.

Chrome-pickle coatings are also used as mordants for dyes, for colour ornamentation, and bases for lacquer or paint on surfaces that need not be held to close dimensional tolerances. Etching results from the treatment, frequently with 0.0006 to 0.001 in. of metallic surface removed during treatment.

A modified solution in which dimensional loss is reduced is also available. The treatment consists of immersing the properly cleaned parts, for 1 to 2 minutes if un-machined and 15 seconds if ma-

chined (and close dimensions must be maintained), in the following bath:

Sodium dichromate
(Na₂Cr₂O₇·2H₂O) 1.5 lb.
Nitric Acid
(HNO₃, sp. gr. 1.42) 1.5 pints
Water to make 1 gal.

For finish-machined parts, where practically no dimensional loss can be tolerated, the pieces can be dipped for 15 seconds in a milder bath:

Sodium dichromate
(Na₂Cr₂O₇·2H₂O) 0.75 lb.
Nitric Acid
(HNO₃, sp. gr. 1.42) 0.50 pint
Water to make 1 gal.

The baths are operated at room temperature and are held in earthenware, aluminium or stainless steel tanks.

The chrome-pickle coatings show the interesting visual property of a whole range of colours from

Table IV—Economy vs Utility of Inorganic Coatings on Aluminum

Coating or Finish	Use	Relative Economy and Utility
Caustic Etch	Attractive white satin finish	No added corrosion resistance, most economical coating to apply; for decorative purposes.
Alrol	Corrosion resistance or paint base	Not as corrosion resistant as anodized coatings. More economical to apply than anodizing. Can be applied on small parts in bulk.
Anodizing (chromic acid)	Corrosion resistance Paint Base	High corrosion resistance. Economical. Not to be used on alloys of copper content more than 5 percent.
Anodizing (sulfuric acid)	Corrosion resistance Paint Base Dye Mordant	High corrosion resistance. Economical. Can be dyed, with beautiful fast colors resulting.
Phosphate	Paint Base	Inexpensive treatment where aluminum is to be finished with organic coatings.
Plating	Decorative or specific of finally deposited metal	More expensive than other processes but frequently required for sales appeal or other specific application. Heavy plating for corrosion resistance generally not warranted from an economy point of view.
Immersion Tin Plating	Prevention of seizing galling, scuffing	Inexpensive process where this specific property is required.



Aluminium alloy housings after salt spray test. Before test, housing on left was anodized and painted, housing on right was painted without first anodizing.

*What's in a
name?*



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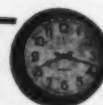
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matte, gray to yellow-red irides-
cence having a pebbled etch
under the microscope, bright red
tints with green shades, bright
brassy coloured surfaces that are

nitric acid content. Brassy and
silvery coatings result from
increased nitric acid and the
duller, less colourful coatings
appear with newly prepared baths.
Table III compares practical
qualities of the variously coloured
chrome-pickle coatings.

The chrome-pickle coatings also
have low electrical resistance and
can therefore be applied on mating
surfaces of machined parts that
conduct electricity

The chrome-pickle treatment
offers considerable protection in
normal inland or excessively
humid atmospheres. However, in
salt water or salt spray environ-
ments, chrome-nickel coating of
magnesium without painting is
recommended. Dichromate is the
preferred final treatment for mag-
nesium alloys where maximum
salt water corrosion resistance or a
highly corrosion resistant paint
base is desired. In this treatment
the articles after proper cleaning
are immersed for 8 minutes in an
aqueous solution of hydrofluoric
acid (15-20 per cent. by weight)
maintained at room temperature
and contained in a lead lined tank.
After rinsing, they are immersed
in a boiling solution of sodium
dichromate (10-15 per cent. by
weight) for 45 minutes. The coat-
ing formed is a rich velvety dark
brown or black. Despite the long
processing time, advantages of the
treatment are:

1. It affords the most salt water
corrosion resistance of any of the

comparatively smooth when viewed
under the microscope, to bright
silvery coatings. These colour
ranges are functions of the
"worked" age of the bath and the

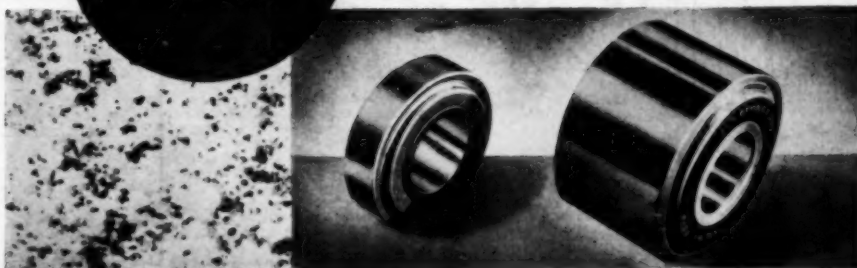
Table II—Practical E.M.F. Series

Magnesium
Aluminium
Zinc
Cadmium
Iron
Corrosion-Resistant Steels (active)
Soft Solder
Tin
Lead
Nickel
Brass
Bronze
Nickel-Copper Alloys
Copper
Corrosion-Resistant Steels (passive)
Silver Solder
Silver
Gold
Platinum

(Turn to page 48.)

sealed

**to keep out dirt...
to keep lubricant in...
to cut maintenance...
to simplify design...**



**NEW DEPARTURE
N-D-Seal Bearings**

Do away with oilers

Occupy less space

**Reduce Assembly
costs**

**Facilitate modern
designing**

On the left is a highly magnified photograph of ordinary dust, found in the air in the average factory or machine shop. It is forever trying to get into bearings to shorten their life and destroy their accuracy. New Departure self-sealed ball bearings keep dirt out and lubricant in. They cut down, sometimes entirely eliminate, bearing maintenance expense. (There are records of N-D-Seal bearings showing no visible sign of wear after eight years' use.) Under every conceivable working condition, from a modern, clean bakery to the dust and grit of a big mine, New Departure self-sealed ball bearings are saving machines and time, increasing production and adding to profits. Check with your nearest New Departure Distributor and learn what New Departure sealed-for-life bearings can do for you.

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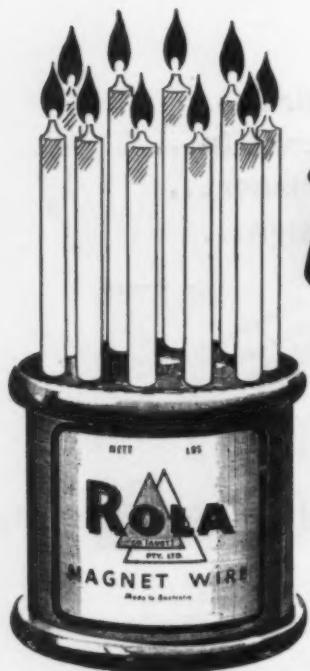
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This year makes a decade in the history of a new Australian industry — the manufacture of Magnet Winding Wires — which was pioneered by Rola Co. (Aust.) Pty. Ltd. in 1940, when, to forestall

potential war-time shortages in the Australian Electrical Industry, it installed the first units of a modern wire-making plant.

Despite the claims by some local experts, repeated at a 1941 Tariff Board enquiry, that the manufacture of Magnet Winding Wires in Australia was uneconomic, the new enterprise was a success from the start.

To date, more than 12,000,000 pounds of Rola Magnet Winding Wires have been supplied to Australian radio and electrical manufacturers and the Company is still pioneering new developments in magnet wire techniques.

Most important of all, this new Australian industry has become firmly established — there are now three independent manufacturers of Magnet Winding Wires in the Commonwealth — and Australia has made another important step on the road to self-sufficiency.



ROLA CO. (AUST.) PTY. LTD., The Boulevard

RICHMOND, VIC., and 116 CLARENCE, STREET, SYDNEY

(Continued from page 48.)
chromate or dichromate treatments for magnesium and its alloys.

2. It provides a good corrosion resistant paint base for magnesium and its alloys.

3. Negligible dimensional changes result from this treatment, making it valuable for finish-machined parts.

4. Inserts of brass, bronze, and steel are not corroded by the treatment, but aluminium portions and cadmium plate are attacked by the hydrofluoric acid solution.

5. The process is easily operated and does not require electrical current.

The "Modified Alkaline Dichromate" treatment is almost as resistant to salt water corrosion as the dichromate treatment and forms a coating that is harder and

Table III—Color and Quality
Of Chrome-Pickle Coatings
On Magnesium

Color	Quality*
Matte gray.....	Less corrosion resistance than colored coatings. Good paint base.
Yellow-red indefinite.....	Good corrosion resistance. Very good paint base. Best all around coating.
Smooth brassy coating.....	Best corrosion resistance of all coatings. Poor paint base.
Silvery coatings.	Poor corrosion resistance. Poor paint base.

* The words "good, poor, best" refer to other chrome-pickle coatings, not other types of chemically produced coatings.

more abrasion resistant. After 5 minutes in hydrofluoric acid, the pieces are dipped for 45 minutes in a boiling solution of:

Ammonium Sulfate 4 oz.
Sodium dichromate 4 oz.
Ammonia (sp. gr. 0.88) . 1/3 fl. oz.
Water to make 1 gal.

This is followed by a 5 min. dip in a boiling solution of arsenious oxide (1 per cent. by weight). The coating produced ranges from dark gray to black in colour and there are no significant dimensional changes. It has essentially the same advantages that apply to the Dichromate treatment. However, the solution used is somewhat more complex, and an additional process step is required.

There are available processes for treating magnesium which form absorbent coatings suitable as mordants for dyes. In these processes the magnesium surface is first converted to the hydrated oxide, after which the articles are immersed in suitable dyes. The resulting colours are rich and porcelain-like in texture. The processes are simple and relatively inexpensive; one such method merely involves heating the articles in water at 85 to 100 C and then dyeing. Single step processes use a water soluble dye in the solution.

More effective than the chemical conversion coatings for corrosion

(Turn to page 75.)

Thickness Gauge for Continuous Sheet

An Industrial Application of Radio-Active Isotopes

THE plastics industry is already benefiting from the production of radio-active isotopes by their use in a thickness meter measuring weight per unit area. To-day these isotopes are being produced in quantity for industrial use in both "Gleep" and "Bepo," the two atomic piles of the Ministry of Supply's Atomic Energy Research Station at Harwell, which release and control the energy produced in the splitting of uranium atoms. The atoms of the chemicals inserted in these two nuclear reactors are bombarded with neutrons which they absorb and become irradiated, the stable element emerging as a radio-active isotope.

A radio-active isotope is not only one of the forms of a chemical element, but its emission of radiation takes various forms. It is unstable and disintegrates in the same way as radium. While retaining all the properties of the normal forms of the chemical elements from which they are evolved radio-active isotopes are possessed of one great advantage, their existence cannot be hidden, their revelation being inevitable by the use of either a Geiger-counter or an ionization chamber. It is this quality of detectability which has constituted the basis of all industrial application.

APPLICATIONS OF ISOTOPES.

The applications of radio-active isotopes fall into three groupings. Tracer methods, used where a particular radio-active element is to be detected in small quantities or in the presence of chemically identical stable atoms, constitute the first. The second is concerned with applications in which the radiation emitted by the radio-active isotope is used to perform some special function. The third is devoted to radiographic techniques.

New industrial applications are being discovered every day. One of the most important uses in this field which has already proved itself of great value is the measurement of web thickness. A constant check can be kept on the thickness of material produced in a continuous roll, such as p.v.c. sheeting.

A very recent application of this device to the plastics industry has already resulted in the installation of four Beta gauges in different factories with equally beneficial results, while a company formed early this year, working under licence from the Ministry of Supply, was responsible for the installation of the fourth. The first

three emanated from Harwell itself.

The Beta gauge acts as a non-contact thickness gauge which relies for its operation on the fact that the beta radiations from isotopes are reduced in strength on passing through an absorbing material by a definite amount, depending on the mass per unit area, and hence the thickness, of the material. This property of radio-active isotopes enables a continuous comparison to be made between standard thickness and the thickness of the moving p.v.c. strip, any deviation from standard of the latter being immediately registered.

USE OF BETA GAUGE.

In order to effect this comparison two radiation sources are employed, one monitoring the moving belt, the other a constant standard thickness. The medium of assessment is the reduction in strength of the radiations of both sources. Any variation from standard setting will result in fluctuations one way or the other in the radiation strength reductions from the source monitoring the moving belt compared with the steady strength reduction of that monitoring the sample of standard thickness.

Beta particle sources are suitable for measuring p.v.c. thickness. With the sources at present available this method has been used to measure p.v.c. sheeting up to 0.080 in. thick. For greater thicknesses an instrument which will use soft gamma rays is under development.

The beta particles (or rays) are fast-moving electrons given off by radio-active isotopes, while gamma rays are electro-magnetic radiations similar to only more penetrating than X-rays.

The source of radiation is a pure beta emitter deposited on a flat dish. The choice of a radio-active isotope for the source depends on the range of materials to be measured. The life of the source normally supplied is about 5 years.

The detector units are identical cylindrical ionization chambers with standard dimensions of 9½ in. in height and a diameter of 4½ in., while non-standard shapes can also be obtained. The full scale sensitivity of the instrument can be adjusted for values from plus or minus 5 per cent. to plus or minus 20 per cent. of standard, but under normal operating conditions it is capable of detecting variations of plus or minus 1 per cent. of standard.



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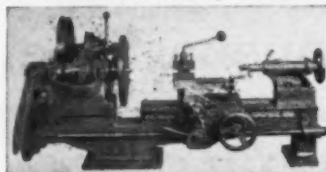
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The radiation is measured in the two detectors by the change in conductivity of the air produced by ionization, an ion chamber being employed. The difference of the small electric currents flowing in the two detectors is amplified and shown on a meter. The ion chamber consists essentially of two electrodes immersed in a gas. The ionization produced by nuclear particles passing through the gas gives rise to a current in an extended circuit when a P.D. is applied between the electrodes. This current is unusually small, of the order of 10^{-10} amp., so the insulation between the electrodes has to be of a high order. The two electrodes are formed by the central rod, which is used as the collecting electrode, and a cylindrical case surrounding it, to which the H.T. voltage is applied. The whole is enclosed in a gas-tight, earthed metal case.

The range of weight per unit area over which the instrument can be made to measure is from 1 to 100 milligrams per sq. cm. Sources will soon be available to enable this range to be extended to 1 gram per sq. cm. and experiments are being conducted to extend the range below its existing level at the other end of the scale.

If required this thickness meter can be made either to light a lamp, ring a bell or operate a mechanism controlling the thickness when the measured value of the belt thickness differs from the standard by a specified value. When the sheet being produced is identical with the standard the meter on which the output is registered reads zero. When a discrepancy occurs the meter indicates not only in which direction the difference lies but its extent, so that the error can immediately be corrected by the machine operator. The meter can not only be calibrated in percentage differences of from 5 to 20 per cent. full scale, but also for errors in thousandths of an inch when the density of the material being manufactured is constant. However, owing to the natural decay of the sources, re-calibration is necessary at intervals of a few months. Another advantage of the meter is that it can be set to average over any given time, thus obviating the effect of small point-to-point variations.

CONGESTION, TAXA- TION AND CONTROLS HAMPER PROGRESS.

As the international situation grows more difficult, the fact that our heavy industries are working far below capacity and that our transport is seriously disorganised at its key points, must cause us deep concern. Unless some determined and sustained effort is made at once to clear the bottlenecks in our shipping and railway systems, we cannot expect to cope with any emergency with hope of success.

One of the outstanding causes of this congestion which is long over-due for relief, is the embargo on the construction of commercial buildings. The concentration on homes and factories, without a corresponding increase in the facilities needed to service them, has unbalanced all our system of distribution and caused a state of congestion that is seriously adding to costs in all directions.

The shortage of wharf space, stores, warehouses, offices and shops which are all operating beyond normal capacity, is further accentuated by the 40-hour week and the increasing delays caused by its application.

Industrial production as reported by the Commonwealth Division of Industrial Development has increased by 45 per cent in volume since 1939. However, there has been little extra provision made to accommodate this extra 45 per cent. output, with the result that wharves,

(Turn to page 82.)

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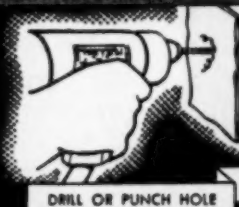
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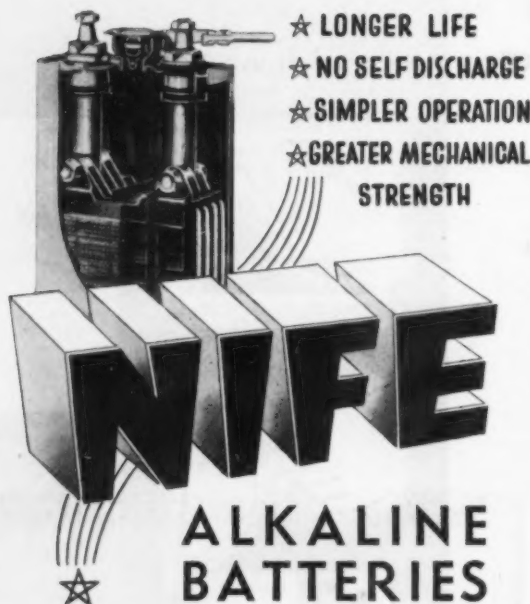
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(Continued from page 50.)

stores and warehouses are congested to bursting point.

Taxation which still stands at 27 per cent. of the national income, is surely at a most dangerous level. Undoubtedly, we will be shortly called upon to make a national effort that will be a drain on the nation's purse. As any further taxation will defeat its own ends by reducing national income, it is difficult to see where this additional revenue is to come from.

The work commenced over two years ago by a committee of the Sydney Chamber of Commerce to have a report compiled, showing the necessity of a complete overhaul of the existing income tax legislation, was brought to finality during the past twelve months, and there is now in existence a Federal Committee, representative of Chambers of Commerce and Chambers of Manufactures in all capital cities, as well as of the Institute of Chartered Accountants in Australia. This Committee is now in a position to place its views before the Taxation Committee appointed by the Federal Government, and will do so in the very near future. As a result of the work which has been done, it is hoped that not only will there be simplification of the income tax legislation, but also a removal of many anomalies which exist, and the burden of taxation made easier to carry.

A great deal of thought has been given to the wisdom or otherwise of pressing for any alteration in the rate of exchange of the Australian £ in relation to £ sterling.

While no recommendation has been made by the Chamber's Council, it is felt that this is a matter that should be approached from the angle of national welfare only and not because of the effect on any particular section of the people.

Although five years have passed since the close of the war, some price controls then imposed linger

on, although they were instituted purely as emergency measures.

Foremost is price control which has become useless in its effect and farcical in its implementation under 6 State Ministers meeting periodically in different States.

The Prices Commissioner has repeatedly stated that price control will be relinquished on any lines in respect of which the supply is up to demand, but it is evident there is considerable difference between the views of traders and the Prices Commissioner in the interpretation of that phrase.—[From the address delivered by Mr. K. F. Coles to the recent Annual General Meeting of the Sydney Chamber of Commerce.—Editor.]

COAL SHORTAGE REDUCES 8.H.P. OUTPUT.

Further evidence of last year's disastrous general coal strike was furnished by Mr. Essington Lewis, chairman, Broken Hill Pty. Co. Ltd., when he declared at the recent annual meeting of the company in Melbourne that total output of steel ingots from the Newcastle and Port Kembla works was only 67 per cent. of capacity. "Local consumers," he added, "were forced to import highly priced steel from overseas, and this threw a further heavy burden on the Australian economic structure. Overall production results for the financial year were seriously affected by the general coal strike." Mr. Lewis went on to point out that when the war ended five years ago, Australia, of all the combatant nations, was the most favourably placed for expansion and development. "Although the opportunity still exists," he said, "it is lamentable that in the case of steel, progress has been impeded."

Indeed, when it is realised what could have been accomplished, to-day's position can only be described as tragic.

Insecticides

The Problems and Progress of a Vital Industry

There are no intervals of peace in the war with insects. There is not even the querulous state of cold war. The struggle is perpetually hot, and man is always on the defence. It has been prophesied that the last form of life on earth will be an insect sitting on a dead plant. If this be so, man's only legacy will probably be the fact that the dead plant is radiating atomic particles!

If we look beyond the man-made problems of iron curtains, dollar scarcities, and sensitive national sovereignties—and let us for once admit that it is about time mankind grew out of these inhibitions—our greatest danger is the vast rate at which the human population is expanding. The world's capacity to produce food must expand at an equivalent rate if starvation is to be avoided. The pattern of starvation would be seriously uneven; different countries and different races would experience its pangs at different intensities. There would inevitably be appalling struggles for pitiful crumbs and fast crusts.

Man has a fair chance of evading this fate. The full extent to which food production can be increased by modern methods is unknown. We can but guess at the potential productivity of land now lying waste or being under-cultivated.

The organised application of science to food production is not much more than a century old and there are many parts of the world where even its first effects have yet to be felt. To estimate the likely population of the world and its total food needs fifty or a hundred years ahead is frightening. But there is considerable reassurance in the production columns of the budget—provided that science is allowed to make its maximum contribution to agriculture. The dawn of an era of large-scale starvation can be considerably postponed, and during the period of postponement it is likely that mankind everywhere will gradually learn to control the rate at which populations expand.

One of the principal means by which food supplies can be increased is the intensification of man's defence against the insect marauders of crops. In this, as in most battles, attack is the best form of defence. As competitors with man for the same foods, insects possess a number of advantages. They can multiply their numbers at incredible rates and speeds. They can adapt themselves to new foods and new conditions with a superlative sense of survival. And the number of different species probably runs up to the million mark. Their competitive attack never ceases on all fronts, and it is naturally flexible beyond the dreams of any field-marshal. Against all this, the insecticide gives man a superior weapon, and he can choose—at least to some extent—the places and conditions of defence by attack. Mass murder by poison is the logical answer to a mass-breeding enemy. Relatively minute amounts of substances and quite small numbers of men are required to wipe out thousands of millions of insect pests.

However, it is not as simple as all that. The insect poisons used must not also be poisonous to man. Nor must they injure the plants they seek to protect. Furthermore, many species of insects are largely or wholly useful—the bee is essential as a pollinator of fruit blossom; and numerous species are themselves enemies of pest insects, maintaining what is sometimes called "the balance of Nature". Insecticides must be selective, making victims of pests without also slaughtering our fifth column in the insect universe. The development of efficient insecticides is one of

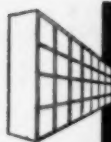
the most complex problems of science. The entomologist, the chemist, the engineer, the agriculturist, and the medical research worker must all play a specialised part. It is one of the more encouraging aspects of our time that the past decade has been an unprecedented period of progress in this subject. Many new insecticides have been discovered. Indeed, it could perhaps be said that too many have come along at the same time, overcrowding the scene and making it more difficult to sort out the swans from the geese. A period

of reflection and consolidation is badly needed but it seems unlikely. We are not at the crest of a wave of discovery but only at its beginning.

The history of insecticides for crop protection is a long one if sporadic attempts to use chemicals are considered. Systematic use did not begin, however, until about 1860-65. The first insecticides were sulphur and compounds of arsenic; the former chosen for its fumigant and repellent properties, the latter for its obviously poisonous nature. There were, too, the "natural" in-

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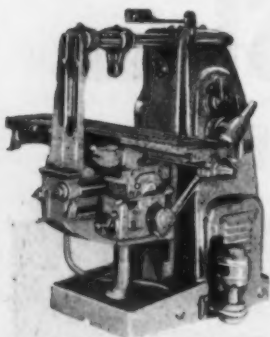


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secticides—such as derris, pyrethrum, quassia and nicotine—substances whose toxicity to insects was already known; these materials might be said to have been "ripe for development" as weapons in the organised battle with farm and garden pests. Until the early twentieth century, however, progress was slowly and painfully made by practical trial and error rather than by planned and large-scale scientific study.

The modern period began a few years before the first World War. A short list of agricultural insecticides had by then been established and a long list of conflicting experiences of success and failure was associated with their forty or fifty years of use. D. P. Hopkins reports in a recent issue of "Scope". The urgent need for really fundamental research was only too apparent. Exactly how did each insecticide kill insects? To what extent did the method of application influence the practical results? In Europe, Britain, and America, investigations along these directions gradually lifted the whole subject out of the hit-and-miss rule-of-thumb category.

It became clear that there were two main types of insecticide, plus a third and subsidiary type. There was the stomach poison which could be deposited upon plant surfaces and which killed the plant-eating type of pest as soon as it sought its first meal, e.g., the arsenate sprays. There was the contact poison which killed insects by falling upon their bodies and being absorbed through their waxy skins or cuticles, e.g., derris and pyrethrum. The third class was the repellent or fumigant materials, e.g., naphthalene. The concentrations of these substances required to kill specific pests were closely studied; methods of applying them, both as dusts and sprays, were improved so that greater cover and penetration were secured. But the resultant accumulation of precise knowledge could not be rapid; it required long-term tests, both in the laboratory and the field.

The many limitations of the then-known insecticides were revealed. For example, there was a minimum concentration for an arsenate spray if it was to be effective in pest control. But there was, too, a maximum concentration if it was not to injure the plant or tree and if it was not to leave arsenical residues on the produce too large to be safe for eventual human consumption. These often narrow margins between effectiveness and safety had to be established. From the point of view of safety, the natural insecticides were outstanding. Derris, specifically toxic to a number of insect pests, was harmless to humans; so, too, was pyrethrum. Nicotine, though a dangerous poison, was safe in practice for, after a lethal contact with pests in crops, it soon evaporated and left no residues upon the plant surfaces. To some extent, the hazard of killing beneficial insects could be minimised by the seasonal timing of applications; this was particularly the case with orchard spraying.

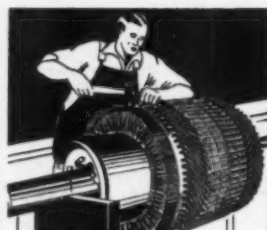
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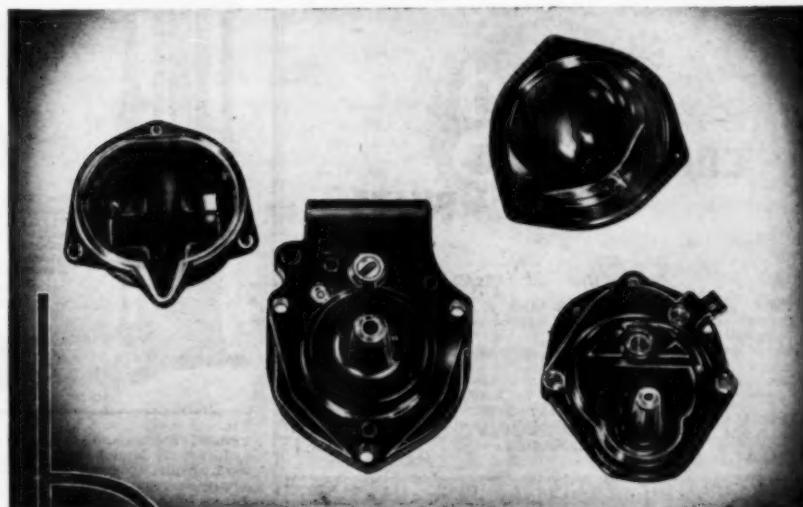
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Another important aspect of scientific progress between about 1910 and 1939 was the investigation of the toxic ingredients or principles of the natural insecticides. Derris's insecticidal property was traced to its content of rotenone; that of pyrethrum to its content of certain esters known as the pyrethrins (though with pyrethrum there has since been further work which has revealed additional toxic ingredients in its composition). The object of this kind of research was twofold; to find means of measuring and checking the potency of natural materials which tended to vary in toxicity, and to discover whether the toxic organic substance in these insecticides could be synthesised, thus obviating the more cumbersome natural methods of production. In fact, however, the nearest we have got to synthesising a "natural" is the synthesis of a close chemical relation of one of the four toxic principals in pyrethrum. Large-scale production of this new material, called allethrin, has begun in America.

The whole of this period from 1910 to the outbreak of the Second World War was one of clarification. Though to many users the insecticides which were developed in that period were new, they were not in fact previously unknown or untried. An authoritative French text-book of 1911 lists almost every major insecticide still being used in 1939. The scientists of this first modern phase were map-makers, finding and recording the main roads and paths along which future development must travel. In exposing the limitations of the known insecticides, they were defining the properties which better insecticides should possess. At the same time, they made the most of the limited range of materials by developing surer and safer methods of application.

It will probably surprise no one to suggest that the second modern phase began with DDT. Though so much has been written about DDT, the first synthetic insecticide, many people imagine that its arrival was sudden, and it is worth pointing out that the research which eventually led to DDT was based upon an "old wives' tale" and began as long ago as 1915. It was strongly believed by housewives that green-dyed wools were never attacked by moths. This popular idea was investigated by a German dye-stuff company. First it was found to be quite wrong; moths did attack green wool. Then it was remembered that the early green dyes were bluish and a yellow dye had been added to correct this tendency. The yellow dye was the chemical substance which had deterred the clothes-moth. Several organic chemicals, similar in structure to this yellow dye, were developed as useful moth-proofing materials between the two wars. A Swiss chemical firm, Geigy, was among the European pioneers of these improved moth insecticides. In 1942, and as a direct outcome of this earlier chemical work, they evolved DDT. The story of its secret transmission from war-sur-



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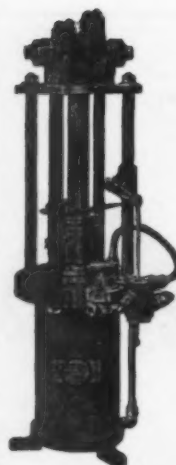
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rounded Switzerland to America, and its rapid development as a wartime weapon against body lice and disease-carrying insects is too well known to require re-telling.

But DDT was not alone. Also in 1942 British research workers of Imperial Chemical Industries discovered that another easily synthesised organic chemical had remarkably powerful insecticidal properties. This was benzene hexachloride, now better known as "Gammexane", a substance first made and described by Faraday in 1825. This chemical can exist in several different forms (isomers) according to the pattern in which its eighteen constituent atoms are arranged. But only one isomer—the gamma form—is strongly toxic to insects.

Both these chemicals killed a wide range of insects. Only small "doses" were needed; and much larger quantities had to be consumed by man for any serious toxic human effects to occur. Their action upon insects was that of a contact poison but with some stomach poisoning effect as well; the contact effect was remarkably persistent and residues remained insecticidal long after the initial application.

At first it seemed that the insect world had been unconditionally conquered. But not all the high hopes with which DDT entered post-war agriculture have been fulfilled. Its wide-ranged toxicity to insects, so great a virtue for pest control in the home or in disease-spreading centres, was a disadvantage in agriculture. Its persistence, also a great virtue in domestic and sanitation use, actually aggravated its lack of selectivity in crop pest control. This does not mean that DDT has been a failure in agriculture; but these weaknesses have imposed limitations upon its use. More and more it has become realised that DDT must be used at times and for pur-

poses in which its disadvantages are minimised. Furthermore, its residues could, in certain circumstances, be more toxic to humans than was originally supposed. DDT is not readily removed from the system—it builds up in fats and fatty tissues. Because it is built up in the milk of cows fed upon DDT-treated forage crops, the U.S. Food and Drugs Administration in 1949 had to decide that no tolerance for DDT in dairy produce could be permitted. In effect this has banned the use of DDT as an insecticide on dairy farms in the United States. At the same time, U.S. officials have emphasised that DDT's use in other types of cropping has been beneficial without being dangerously toxic to human consumers of the produce. The risk is associated with DDT's solubility in fats and it is therefore much greater when fatty products like milk are being produced.

It is true to say that the limitations of DDT which have gradually emerged are only disappointments against a background of exaggerated expectations. The equilibrium of growing plants, pests, and beneficial insects is complex, and no insecticide can be flung into this equilibrium without some creation of new problems. Of no subject is it truer to say that more haste means less speed. DDT "boomed" to begin with; it has since settled down into the quieter position of one member in the first team of agricultural insecticides.

In some respects the post-war story of "Gammexane" in agriculture is the inverse of DDT's story. "Gammexane" revealed its most awkward limitation to begin with, and as a result development has been more cautious. This limitation was an unpleasant musty odour, which could in certain uses be passed on to the crop as a flavour taint. This was caused by impurities, by the non-insecticidal

(Turn to page 58.)



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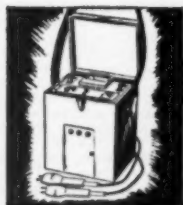

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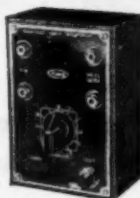
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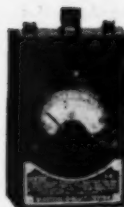
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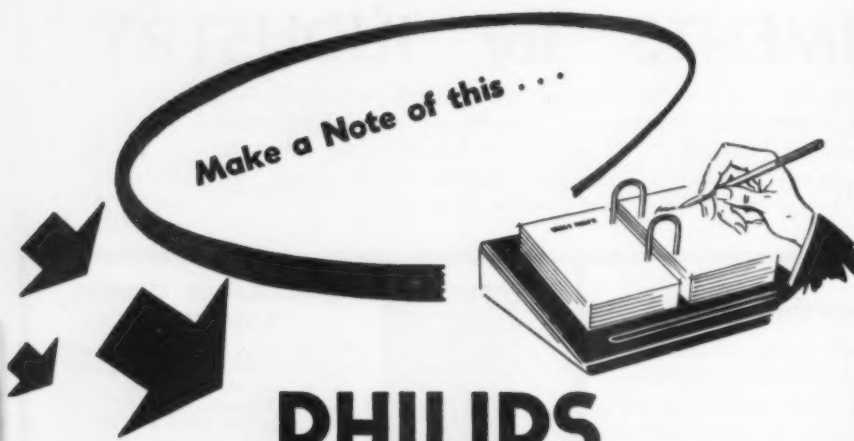
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(Continued from page 56.)
isomers of benzene hexa chloride which are always produced with the gamma-isomer in its manufacture. Great progress has been made in recent years in purifying the gamma-isomer and removing these unwanted impurities. As a result, an even more powerful insecticide unhandicapped by the

odour and taint trouble has been produced; though more costly, this form can now be used in types of application which are likely to pass on the taint to the final crop.

Although "Gammexane" has much the same persistence of toxicity as DDT, it is more volatile; physically, therefore, the residues do not stay on crop foliage for

so long. An even more important aspect of its volatility is its success as a soil insecticide. A soil insecticide must be sufficiently volatile to "spread itself" through the soil, yet not so volatile that it passes out of the soil. For that reason naphthalene has been a useful soil pest repellent though it does not possess much actual toxic-

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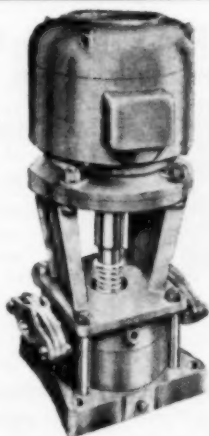
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ity to insects. "Gammexane" offered both powerful toxicity and the physical suitability of naphthalene, and it is not surprising that it has given the first really hopeful answer to the acute problem of wireworm infestation. The taint difficulty was pronounced in this soil use of "Gammexane", but the purer taint-free material now available can even be combined with fungicides in seed dressings. Another advantage derived from the readier volatility of "Gammexane" is that it can be used with great effectiveness in "smoke" generators, a cheap and efficient method of application in closed spaces, eg., greenhouses, food stores.

Nevertheless, it would be misleading to emphasise the successes and limitations of the two original "synthetics". They must be regarded as the first of many such insecticides. Without digressing into chemical complexities, let it be said that there is an almost endless variety of organic substances and it is not difficult to select substances, or even to synthesise previously unknown substances, whose molecular structures resemble those of DDT or benzene hexachloride; this type of research, stimulated by the discovery of the first synthetics, has led to the development of a number of others. More than a few of these, especially in America, have become commercial insecticides. Others at present are still in their pilot-stage of development. Methoxychlor, a chemical first cousin of DDT, is much less toxic to humans yet for certain insects it is as powerfully toxic as DDT; it may take the position which DDT has had to vacate in dairy farming. Chlordane is chemically related to benzene hexachloride, and in America it has also been highly effective as a soil insecticide and ant killer. Indeed, too many rather than too few synthetics have been introduced in half a decade, and we have not yet had sufficient time to assess their virtues and limitations.

While DDT was being weaned in Switzerland, German chemists were at work on another chemical class of poisons, complex organic compounds of phosphorus. During the war they succeeded in developing at least three notable synthetic insecticides, now known as HETP, TEPP and parathion. Unlike DDT and "Gammexane", these synthetics are highly toxic to man and animals as well as to insects. But HETP and TEPP, after mixing with water or on exposure to moisture, gradually change into quite

(Turn to page 60.)



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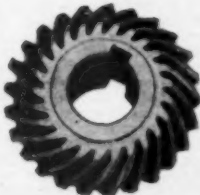
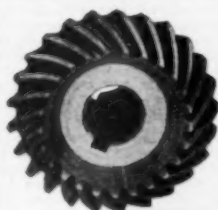
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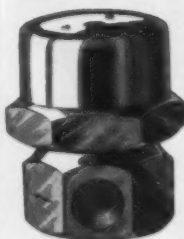
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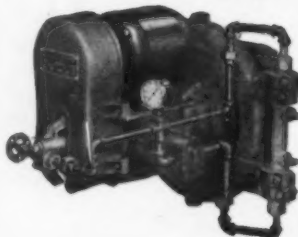
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(Continued from page 58.)

harmless substances; thus, though they are dangerously poisonous initially, they do not leave poisonous and lasting residues. Furthermore, they are powerfully toxic to one of the most common classes of crop pest, the aphids, against which DDT is not very effective. Parathion, though exceedingly toxic to insects, is questionably dangerous to humans, especially to spray-operators. Until more is known about parathion's chemical composition and toxicity, it should be used with the greatest caution and only by skilled personnel who are well aware of its dangers. Indeed, British opinion, both among research scientists and manufacturers, is tending to the view that this organic-phosphorus class should be applied only by trained and experienced spray-operators. It should be pointed out that all three are mixtures of complex substances. Further research may purify and standardise their compositions so that the insect-toxic ingredients are increased and the human-toxic ingredients are reduced.

A further post-war development is very recent. This is the systemic insecticide. It does not have to be deposited upon plant surfaces. It is absorbed from applications watered into the soil, and it enters the sap-stream of the plant. Thus, the growing plant becomes toxic to all sap-sucking pests. Several systemic poisons of this kind were known, but all of them also made the plant seriously toxic to humans. British research has led to a systemic insecticide which is reported as non-toxic to humans provided that treated produce is not cut for consumption sooner than six weeks after the last application. At present, it is recommended for use on a limited number of crops, notably for sugar-beet. It offers two important advantages. First, it is absolutely selective, for it is toxic only to in-

sects which indulge in sap-sucking and such insects must be pests. The risk to beneficial insects is negligible. Second, the method of application is simple and cheap; large volumes of water and specialised spraying equipment are not required. Here it might be pointed out that in most commercial work with insecticides the cost of the operation considerably exceeds the actual cost of the basic material. This economic aspect of the systemic insecticide may outweigh its unique selectivity. However, this is the newest of the synthetic developments and it is necessary to reserve judgment; limitations have a habit of revealing themselves in the stop-press columns of experience. In any case, more synthetic insecticides of this type are likely to be developed.

It would be quite wrong to suppose that these new materials have displaced the old and pre-war insecticides. Crop protection is increasingly practised and there seems to be plenty of room for all the recognised materials. The safety of the "naturals", particularly of derris, still gives them a dominant place in general garden use. In America there have been sharp signs of over-production of new synthetics but this may be to some extent a reflection of the world's dollar shortage. It is difficult to separate agricultural demand from domestic and public health demand, for the basic chemicals are produced for both markets and are formulated for their separate purposes subsequently. There is not in any case a flexibly expandable supply of such materials as derris and pyrethrum; they are natural extracts and supplies can only be increased slowly and by long-term planning. The modern formulator has a much larger supply of insecticidal materials and a far more varied list to select from; old poisons can be combined with new—thus, oil

(Turn to page 62.)

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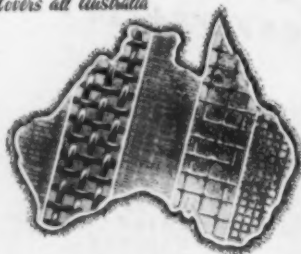
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(Continued from page 60.)

washes for orchards can also con-
tain DDT. The natural flexibility
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Have insecticides paid their way?
In the ten years of 1934-46, the
article continues, it was estimated
in America that 25 million dollars
spent in research on grasshopper
control resulted in a prevention of
crop damage worth 600 million dol-
lars. Nevertheless, the unchecked
damage in the same period from
this one pest amounted to a crop
value of over 400 million dollars.
Complete protection can never be
expected, but these figures show
that the effort involved in intro-
ducing insecticides is amply re-
paid. Nor is the quantitative men-
sure the only assessment. The
effect of insect damage upon qual-
ity, especially with fruit and vege-
tables, is often more serious than
actual yield losses. There are also
many cases where crops could not
be grown at all without some de-
fence against regular pest infes-
tation; in England many crops could
not be planted in soils whose wire-
worm population, as shown by
sample counts, exceeded certain
densities. In semi-tropical and
tropical climates, total crop losses
often follow pest invasions; the
insecticide is the only practicable
and rapid method of defence.

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in an adolescent phase of expan-
sion. There can never be peace in
the war between man and insects.

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Early next year Australia is to
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scientific management, Mr. Alvin
Dodd. This was announced re-
cently by Mr. R. G. Casey, Min-
ister for National Development,
who said that Mr. Dodd has been
invited jointly by the Common-
wealth Government and the Aus-
tralian Institute of Industrial
Management. "The Government,"
added Mr. Casey, "has been glad
to contribute substantially to the
expenses of the visit. Until re-
cently Mr. Dodd was president of
the American Management Asso-
ciation. He is considered an out-
standing leader in the field of
management in the United States,
and the Government believes that
his visit will enable management
in Australia to contribute more to
the solution of production prob-
lems." This is a splendid step and
in harmony with the consistently
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Provision is also made (Patents Act, 1946) for an applicant to obtain damages, if infringement occurs, from the date of publication of the application. A rule of practice has been established whereby an application will be examined more speedily when a prima facie case of alleged infringement is proved.

Particulars of the necessary procedure will be supplied by any Patent Attorney practising in the Commonwealth.

PATENT SPECIFICATIONS ACCEPTED

WATERING DEVICE FOR FOWLS.

137,715.—H. F. Gourlay, Vic.

A cap is secured to the body portion and encloses a valve insert member which is spring-controlled to normally retain it in closed condition. An actuating element extends through the cap portion in such relation to the insert that the valve is opened when the element is effectively pecked by a bird.

The element may be in the form of a ball, and the valve insert is of the type available under the Registered Trade Mark "Schraeder."

APPARATUS FOR SEQUIN MANUFACTURE.

137,716.—H. L. Buckingham, Vic.

An apparatus for the manufacture and the connecting together of sequins comprises means for feeding foil to a die having at least one claw forming punch for expressing from the foil integral

claws and a second punch to form from the expressed material a sequin, means for feeding to the apparatus a thread or strip of flexible material, and means for pressing the claws about the thread to thereby grip same. The apparatus is operated by an electric motor the switch of which is operated by respective gauges should faulty material attempt to pass therethrough.

SURVEYING BY TRANSIT OF VEHICLE OVER ROUTE TO BE SURVEYED.

137,722.—H. J. F. Coe, Vic.

A means for surveying by the transit of a vehicle over the route to be surveyed, that indicates and records levels of the traverse comprises, a stylus contacting a chart attached to a cylindrical platen, mounted for sliding and turning movements in a housing and rotated by a friction driving wheel and linkage from the vehicle drive. The sliding movement is actuated by the tilt of the longitudinal axis of the vehicle and the movement in gimbal of a plan indicating instrument, through arms and link rotating gear train, turning housing about an axis through stylus and platen drive wheel. Visual indication of level changes by coloured lamps

is provided by a series of electrical contacts with a wiper contact adapted to move longitudinally with the platen. The plan recording instrument may be used by means of a split drive to record simultaneously both the plan and profile of a traverse.

HYGIENIC MILK COCK.

137,723.—A. J. Lawrance, N.S.W.

For maintenance of hygienic conditions, there is provided, a hollow stem with a valve seated end and a threaded boss thereon. A stop pin projects rearwardly from the boss, and a socket with internal complementary valve seat is secured through and to a wall of a container, and has a slot for the stop pin to engage therein to maintain the plug in vertical position.

ELECTRIC TORCH SWITCH.

137,729.—H. W. Beck, N.S.W.

Unintentional operation is avoided and positive switching action ensured in a torch switch which consists of an insulated roller member mounted for rotation by pintles and checks the member carrying an off-centre bridging pin which when member is partly rotated bridges spring finger and lug to complete the circuit.

GOLF BALL CENTRE.

137,687.—Dunlop Rubber Co., Vic.

A golf ball centre comprises a rubber sac in which liquid as a filler is injected under pressure. A self sealing filler plug is provided to facilitate filling.

A golf ball having this centre is also claimed.

ELECTRIC WATER HEATER ELEMENT.

137,692.—W. G. Walker & Co. Pty. Ltd., N.S.W.

A heater assembly for operation on three phase comprises three tubular open-ended chambers of glass and having outlet ends of restricted shape, the chambers being arranged side-by-side and connected at the lower and unrestricted ends by a sleeve of rubber to a base fitting of insulating material while core members of heat resistant and electrical insulating material having wound heating elements, are sealed at one end in cavities in the base fitting and extend up within the related chamber. Supply leads or connections to the heating elements pass through the cavities and the sealing material to re-

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lated terminals which are liquid-tightly mounted in the underside of the base fitting and arranged for connection to an electrical supply.

TICKET DELIVERY FOR RACE TOTALISATOR
137,697.—Automatic Totalisators Ltd., N.S.W.

To facilitate the delivery of tickets a totalisator ticket issuer, comprises a feed chute which at one end has a receiving aperture constituting a strip inlet with rollers for moving the ticket strip along said chute and a printing unit having its receiving end aligned with the departure end of the feed chute, a cutting unit having blades being aligned with the departure end of the printing unit screws, fasten the stationary blade and ticket outlet box having an aperture to a bracket on the chassis. The cutter unit and ticket outlet box are quickly detachable by removal of the screws.

MACHINES FOR LASTING SHOES
137,708.—The British United Shoe Machinery Co. of Aust. Pty. Ltd., Vic.

A roll applies frictional drag on the lasting margin of the shoe upper (or similar platform binding) in tension the upper height-wise of the shoe and to exert a stress on the lasting margin of the upper, tending to move the

shoe in a direction to present successive portions of the margin to the roll. A disc having helical peripheral ridges, lays the margin on the shoe bottom, and means, such as a heating cartridge and a heating block may be provided to heat the roller and disc, to activate adhesively a portion of the said margin. Modifications include the substitution of a projection on the disc in lieu of the hinged wiper part.

REVERSIBLE DISC CULTIVATOR
137,970.—J. T. Close.

Claim 1. A reversible disc cultivator or plough comprising a main frame, a pair or pairs of twin cultivating discs, each disc or pairs of discs being suspended from the main frame upon a vertical spindle for angular movement in response to the turning of the spindle, the transverse space or distance between the spindles being variable, an arm connected to each spindle, a link pivotally connected to each arm, and manually operable means coupling the links for turning the spindles in unison so as to adjust the working inclination of the discs or pairs of discs.

ELECTRIC SOCKET PLUG FOR ADAPTOR
137,972.—Novex Pty. Ltd.

Claim 1. An electric appliance



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plug of the type adapted to be connected to a wall socket or to another plug of similar construction to itself, wherein one plug is adapted to engage another in perpendicular alignment and each plug is provided with prongs having outwardly extending contact members and internal clips or sockets as and for the purposes set forth.

THERMAL OVERLOAD RELAY
137,976.—Oliver J. Nilsen and Co. Pty. Ltd.

Claim 1. A thermal overload relay which includes a common mechanical connection to open or

close two secondary circuit contacts, bi-metallic temperature responsive elements suitably supported, helically wound heater coils arranged within the said bi-metallic elements, a primary tripping bar free to slide in the direction of its length, a catch or latch member at one end of the said primary tripping bar, a bush at the other end capable of adjustment along the said tripping bar, discs of insulating material arranged on the said tripping bar and capable of adjustment therealong relatively to the free ends of the said bi-metallic elements retaining springs associated with

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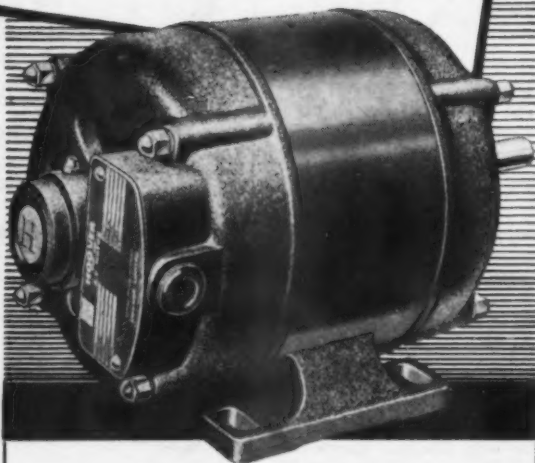
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the said discs adapted to bias the said primary tripping bar to a set position, a secondary release bar adapted to be tripped by movement in one direction of the said primary tripping bar, secondary contacts adapted to be engaged or disengaged by the movement of the said secondary release bar, and connections between the load circuit and the said heater coils.

DRY CELLS WITH ZINC CONTAINER.

137,978.—General Dry Batteries Inc.

Claim 1. A dry cell including a cylindrical zinc container having a bottom wall and an open end, and in which are disposed a mass of mix and a central carbon electrode; an absorbent tubular jacket embracing said container and projecting beyond the open end thereof, a mass of moulded sealing material closing the open end of said container and constituting an end seal, embracing said carbon electrode and closing the end of said absorbent jacket beyond the end of said container, and a separately formed tubular member composed of insulating material impervious to the electrolyte of the cell surrounding said absorbent jacket and having inwardly extending end flanges.

MULTI-FEE TELEPHONE METERING.

157,960.—Siemens Brothers & Co. Ltd.

Claim 1. In an automatic telephone system, a common control circuit for association with any one of a group of selectors having outlets to junctions, and adapted when so associated to register as many digits as are necessary to determine the fee area of a call and which is released as soon as such determination has been effected, and multi-fee metering arrangements wherein the registered digits cause a signal or signals to be transmitted from the common control circuit to apparatus in an outgoing junction circuit taken into use by the associated selector to effect a registration therein appropriate to the fee to be charged, said apparatus subsequently bringing about the operation of the calling subscriber's meter in accordance with the fee area of the called subscriber.

WIRE GRID STRAIN GAUGE MANUFACTURE.

138,046.—R. J. Ashby.

Claim 1. A uniplanar strain gauge of grid-iron type wherein stresses transmitted from the specimen to the gauge are limited to rectilinear longitudinal portions or laps of uniform length while the bights of the grid are relieved of stress, by confining the cementing of the grid to the paper to the said longitudinals with the bights free of the paper.

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95,297. A design of the letters "Let." Trailer trucks and self-propelled trailer trucks.—R. G. Letourneau, Inc., 2301 North Adams Street, Peoria, Illinois, U.S.A.

95,382. "Karbate" Industrial heat exchangers.—National Carbon Company, Inc., 30 East 42nd Street, N.Y., New York, U.S.A.

94,066. "Silent Knight, the People's Refrigerator at the People's Price." Refrigerators, cooling machines, and freezers.—Edward John Lees Hallstrom, 462

Willoughby Road, Willoughby, Sydney, N.S.W.

96,871. "Sun." Pencils.—Eagle Pencil Company, 703 East 13th Street, N.Y., New York, U.S.A.

96,880. "Ultra." Apparatus for sending, transmitting, receiving and amplifying wireless tele-

graphy.—Ultra Electric Limited, Western Avenue, Acton, London, W.3, England.

95,371. Diamond shaped label, showing, inter alia, the words "Emu Brand." Cigar and cigarette cases, etc.—Midland Utilities Limited, 32-34 Regent Place, Birmingham 1, England.

96,858. "Speed-Win." Tennis balls, golf balls, and other sporting goods.—A. G. Spalding & Bros. (Australasia) Proprietary Limited, Ballarat Road, Sunahine, W.20, Victoria.

96,902. "Preen." Furniture cream.—Lewis Berger & Sons (Australia) Pty. Limited, Rhodes, N.S.W.

96,888. "Antiquax." Polishes.—Frank Partridge & Sons Limited, 144-146 New Bond Street, London, W.1, England.

93,721. A label design with the letters "National Blinds." Venetian blinds of wood.—National Blind Company of Australia Pty. Ltd., 42 Bridge Street, Sydney, N.S.W.

94,913. "Ven Elite." Umbrellas.—Paterson, Laing and Bruce Limited, 264-282 Flinders Lane, Melbourne, Victoria.

95,019. "Queen Bee." Knitting pins or needles.—Patons & Baldwins Limited, Darlington, County of Durham, England.

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NOTICE is hereby given that the owners of Australian Patent No. 118,692, dated the 27th January, 1943, are desirous of disposing of their rights in this invention by way of licence, or otherwise. Further particulars will be supplied on application to

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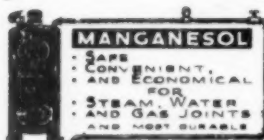
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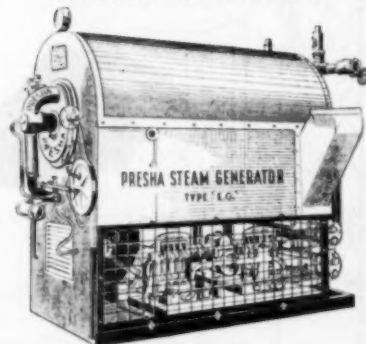
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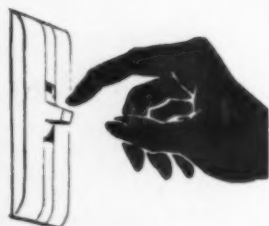
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(Turn to page 75.)

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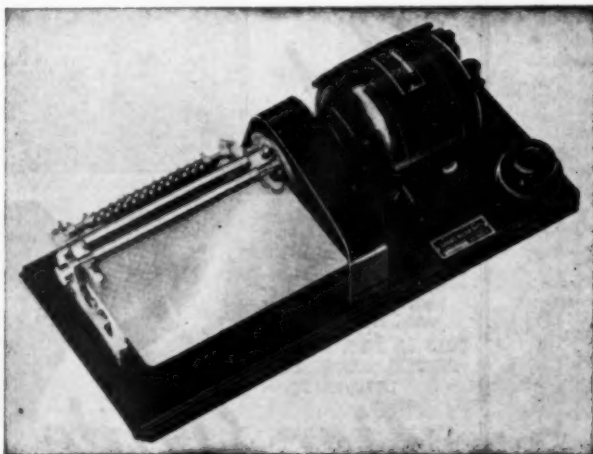
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CERAMIC INDUSTRIES - YOUR EQUIPMENT
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OIL BURNERS, BLOWERS, Etc., Etc.

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From 120 mesh to heaviest 3in. mesh
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OUR RANGE covers the manufacture of wire cloth
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Galvanised for every use in

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Food Preparation, Clothing and
Hosiery Manufacture, Agriculture.

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of any mesh for Stone, Coal,
Fertilisers, Fruits, Cereals, etc.

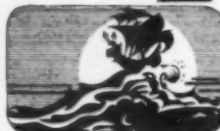
Wire Mesh for Road Making, Poultry
Floors, Lift Enclosures, Windows
and Machinery Guards.

"WRIGHTMAKE" REINFORCEMENTS
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UNSURPASSED QUALITY AND
UNIFORMITY.

Zinc Oxide

Manufactured in Australia by
Crest Chemical Company Pty. Ltd.
PERRY ST., MATRAVILLE, N.S.W.
Telephone FJ2493.

(Continued from page 72.)

Pipes, class "X", 48 in. dia., 296 in. ft., £510; 42 in., 296 in. ft., £420. Humes Ltd.

Motor scythes, "Mayfield", six, £765. Clyde Engineering Co. Ltd.
Heavy duty road ripper, £675. Industrial Sales & Service (Q.) Pty. Ltd.

Brake linings for Diesel buses, £1,255. J. H. Gardiner Pty. Ltd.; £2,753. Martin Wilson Bros.; £2,950. Don Distributors Ltd.; £3,175. Engineering Supply Co. of Aust. Ltd.; £228. Henry & Wightman Ltd.; £241. Philip Frankel Ltd.

Circuit breakers, outdoor type, 750 MVA, 33 kV, 3 phase, 400 amp., with current transformers, excluding oil, £24,905. British General Electric Co. Pty. Ltd.

Simplex air release valves, six, £641. J. H. Liddle & Epstein.

Front end loaders, "Malcolm Moore", three, £1,450 ea. Crossle & Cameron Pty. Ltd.; "Chaseaside", £1,557. Whyte-Hall British Products Pty. Ltd.

Airbreak switches, F.S.C. high tension, outdoor, three phase, 400 amp., 33 kV, group operated, six, £150 ea.; isolating switches, single throw, 33 kV, 400 amp., outdoor, 45, £215/- ea. Lawrence & Hanson Electrical Co. Ltd.

STATE ELECTRICITY COMMISSION

Switchgear, D. E. Taplin Pty. Ltd., Lawrence & Hanson Electric Co. (Qld.) Ltd., Johnson & Phillips & Co. Ltd. Rates

Induced draft fans, £4,188. Crossle & Cameron Pty. Ltd.

Transformers, £15,600 stg. Gresham Transformers Ltd.

Pumps, centrifugal, £376. E.S.C.A. Ltd.

Overhead lines, Mackay. F. A. Ricketts & Son.

Switchboards, Barcaldine, £1,642. Burleys Electrical Workshop Pty. Ltd.

Switchboards, Balonne, £1,947. Burleys Electrical Workshop Pty. Ltd.

Switchboards, Blackall, £1,643. Burleys Electrical Workshop Pty. Ltd.

Pumps, £316. Engineering Supply Co. of Aust. Ltd.

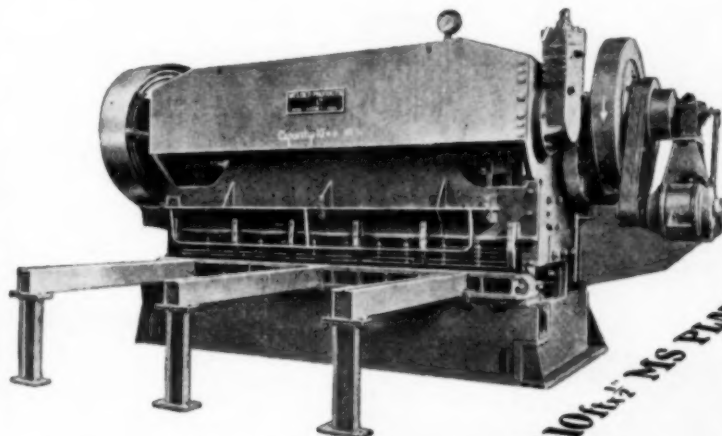
Copper cable, £35,091. International Radio Co. Ltd.; £10,435. Australian General Electric Pty. Ltd.

Inorganic Finishes for Light Metals

(Continued from page 48.)

protection and abrasion resistance of magnesium alloys, is an electrochemical method. Producing a protective and decorative magnesium-oxide-silicate film, it is applied by anodizing in strongly alkaline solution at elevated temperatures, using a-c or d-c. Although these coatings have somewhat higher corrosion resistance and far more abrasion resistance than those produced by the dichromate process, electrical equipment and accessories make the cost higher.

Magnesium can be electroplated commercially, yielding coatings



CUT THREE WAYS

Simultaneously

WITH THIS ALL-STEEL

GUILLOTINE

CUT COSTS, CUT TIME AND 100% MS PLATE

Features—Rigid back pressure beam, which supersedes the conventional fish back cutting beam. Self-contained hydraulic hold-down system. Pneumatically controlled multiple disc friction clutch and interlocked automatic brake. Screw operated self-freeing back gauge. Patent plate splitting device enabling plate of any length to be split in widths up to the maximum depth of the gap.

Cutting three ways simultaneously isn't a new trick—on a Welded Products' guillotine. Metal working plants, all over Australia and overseas, are doing it every day—cutting costs, cutting time, in cutting mild steel. These plants save interruptions to guillotine production through less time out for blade regrinding and renewals.

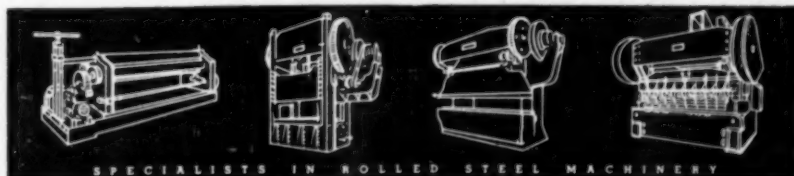
This is only one side of the cost-saving advantages of rigid rolled steel construction—you also get faster operation . . . more accurate, clean-cut work . . . reduced maintenance charges.

Exceptional blade life, rapidity, precision, low maintenance—any one of these will help reduce expenses, but combined they will make for worthwhile savings in production costs per unit of output.

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★ Above—Welded Products' all steel guillotine shears, capacity 10' x 1" M.S. plate.

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ETHYL CELLULOSE; CELLULOSE ACETATE; NITROCELLULOSE; C.M.C. (Carboxy-methyl-cellulose); PARLON chlorinated rubber; NAVAL STORES—YARMOR, pine oil, medium alcohol content; YARMOR 302, pine oil, high alcohol content; THANITE, terpene derivative; HERCULES WOOD TURPENTINE, steam-distilled; DIPENTENE No. 122; SOLVENOL No. 1; WOOD RESINS; VENSOL RESIN; TRUELINE pulverised core binder; STAYBELITE non-oxidising resin.



EUSTON WHITE LEAD, dry and in oil; NUODEX NAPHTHANATE DRIERS, guaranteed metal contents, cobalt, lead, manganese and zinc; MANOX BLUES, bronze and non-bronze; OXIDES, black, green, red, yellow; ALUMINIUM powder and pastes; CARBON BLACK; TANNERS' REQUISITES, oils, etc.; KEENOK single roll paint grinding mills; ROGERS FULL FLOW VALVES.

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*Industrial Chemicals and Raw
Materials for Surface Coatings*

with excellent adhesion. After suitable polishing, cleaning, and pickling, the magnesium parts are immersed in a fluoride-bearing zincate solution, and then copper plated in a cyanide copper plating bath. Then any other desired metal can be plated by normal procedures. Magnesium is plated primarily for sales appeal and attractiveness, which demand highly polished metallic finishes.

Corrosion resistance can be achieved by heavy plates, but this is more expensive than the chemical treatments. When extremely high corrosion resistance is required, the heaviest plate is not as effective as a good chemical treatment, followed by one or two coats of zinc chromate primer, and one or two coats of a baked glycerol phthalate base synthetic. If specialised property combinations, such as lightness with wear resistance or hardness are required, nickel, chromium, or nickel plus chromium coatings can be plated.

ALUMINIUM AND ITS ALLOYS

For most indoor and many outdoor applications, little or no special corrosion protection is necessary to preserve aluminium, since a thin, firmly adherent, "self-healing" oxide coating forms over its surface. However, in highly humid or saline atmospheres, additional protection is required for maximum service life.

Electroplating aluminium purely for corrosion protection is not recommended, unless heavy pore-free deposits are applied; such deposits are not economical for corrosion protection alone. As for magnesium, the most widely used inorganic protective coatings for aluminium are the oxidised or surface conversion coatings. The two types of coating used for this purpose are electrolytically applied coatings, derived from processes known as anodizing, and chemical immersion coatings.

For maximum corrosion resistance, the anodized aluminium films are best. Three anodizing processes are in general use: chromic acid, sulphuric acid, and oxalic acid.

For aluminium alloys with a copper content not more than 5 per cent, the chromic acid process is satisfactory. In this method, the work is the anode for 30 min. or more in a 5 to 10 per cent. (by weight) solution of chromic acid in water, at about 40 volts; this is considerably higher than the voltages used in most electrochemical processes. The coating is thin but dense, grey and dullish.

If the copper content of the alloy is more than 5 per cent., the sulphuric acid process should be used. The coating is formed by making the work the anode in a 10 to 30 per cent. solution of sulphuric acid in water. The coating, thicker and more abrasion resistant than that formed in the chromic acid process, is absorbent and is usually "sealed" in hot water or sodium dichromate. The "unsealed" coating does not change the colour of the surface, but the coating "sealed" in sodium dichromate imparts a yellow greenish cast to the surface. The sulphuric

solvent extraction problems?

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AND WELLINGTON, NEW ZEALAND

Agents: Elder, Smith & Co. Ltd., South Australia and Western Australia;
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SEX-1-X-684

acid process is especially useful if a coloured aluminium surface is required; the anodized coating acts as a mordant for dyes, allowing a wide range of colours to be produced. The aluminium parts are immersed in the desired dye solution and then "sealed" in hot nickel solutions.

Coatings which increase corrosion resistance of aluminium alloys, but not to the same extent as anodized coatings are applied by immersing the work in hot sodium chromate and sodium carbonate solutions, then in a dichromate solution until a grey coloured coating is formed.

TIMBER!

Supplies of

- CASE TIMBERS
- HARDWOOD SCANTLINGS
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- FENCING MATERIAL
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Write for New 24-Page Catalogue

An inexpensive method for giving aluminium a frosty white satin finish, where corrosion resistance is not primary, is called "caustic etching." It consists of immersion in an alkaline solution, such as trisodium phosphate or caustic soda, etching the work until the desired texture — bright or more deeply etched satin — is obtained. This is followed by a dip in 50 per cent nitric acid. The resulting finish is white and uniform, even obliterating many surface defects and scratches.

Aluminium can be plated on a commercial basis, competitive with other finishing methods. If correctly applied the plates are adherent and have the same decorative and specialised utility as on other

metals. The process consists of: polishing or buffing, degreasing, pickling, depositing on the aluminium surface a thin film of zinc from a sodium zincate bath, copper plating, and then conventional plating.

Aluminium surfaces can be immersion plated with a thin film of tin from a stannate solution. The tin plated aluminium surface performs better than unplated aluminium where seising, galling, or scuffing resistance is desired. Many aluminium alloys have been hard chrome plated directly, one application being the preparation of a hard scratch free reflecting surface produced by lapping flat several thousandths of hard chromium plated directly upon aluminium.

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WIRE MANUFACTURERS LTD.
Halifax, England.

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Large or Small Quantities for
Prompt Shipment from England

High Tensile Fencing Wire,
High Carbon Spring Steel
Wire, Hardened and Tempered
Steel Wire, Piano Wire,
Textile and Brush Wire,
Stainless Steel Wire, to all
specifications.

CURRENT TENDERS

NEW TENDERS

The following tenders have
been called since our last issue.
Current tenders which have
been published in previous
issues follow this section.

COMMONWEALTH

POSTMASTER-GENERAL'S DEPARTMENT.

Printed Forms, Revenue and
Expenditure Series (Sch. C.6422).
Oct. 3.

Television Installation at Syd-
ney (Sch. C.6423). Nov. 21.

DEPARTMENT OF WORKS AND HOUSING.

Metal Balustrading to 15 Stair-
cases and 12 Balconies, for Can-
berra. Sept. 19.

AUSTRALIAN ALUMINIUM
PRODUCTION COMMISSION.
Woven Metal Filter Cloth, 12,000
ft. (Spec. Ch. 3). Oct. 2.

COMMONWEALTH
RAILWAYS DEPARTMENT.
Brake Beam Safety Chains.
Sept. 26.

Covered Goods Wagons. Nov. 7.
Water Tank Wagons. Nov. 7.

DEPARTMENT OF SUPPLY.

Scrap Brass (194 tons), Pur-
chase of. Sept. 22.

DEPARTMENT OF EXTERNAL TERRITORIES.

Electric Appliances (Sch. 212).
Sept. 19.
Platform Scales (Sch. 211). Sept.
18.

DEPARTMENT OF WORKS AND HOUSING.

Dust Blower and Extractor.
Extended to Sept. 26.
Transformers (12), 250 KVA and
(2) 750 KVA. Extended to Oct. 3.
Water Treatment Plant, for
Nowra. Oct. 3.

NEW SOUTH WALES

DEPARTMENT OF PUBLIC WORKS.

Downpipe, gutter, etc. Sept. 27.
Gas Heater. Sept. 27.
Industrial Gloves. Sept. 27.
M's Plate. Sept. 27.
Platform Scales. Sept. 27.
Rate Control Valve. Sept. 27.
Septic Tank Pump. Sept. 27.
Tank Materials. Sept. 27.

Workshop Equipment. Sept. 27.
X-Ray Equipment. Sept. 27.

FORESTRY COMMISSION.

Concrete Pipes. Sept. 19.
Fire Hose Nozzles. Sept. 19.
Harness. Sept. 19.
Hose Laying Tools. Sept. 19.
M.S. Tanks. Sept. 19.
Piston Rings. Sept. 19.
Septic Tank. Sept. 19.
Spraying Enamel. Sept. 19.
Spotlights, 6V. Sept. 19.
Tubular Gates. Sept. 19.
Wheelbarrow Concrete Mixer.
Sept. 19.

DEPARTMENT OF MAIN ROADS.

Calico Road Signs. Sept. 21.
Concrete Pipes. Sept. 19.
Portable Folding Tables and
Seats. Sept. 21.

STATE CONTRACTS CONTROL BOARD.

Band-sawing Machine. Sept. 18.
Crankshaft Grinder. Sept. 19.
Index Equipment. Sept. 20.
Kitchen Mixer. Sept. 19.
Office Safes. Sept. 19.
Scrap Iron, etc., Purchase of.
Sept. 21.

Steel Lockers and Shelving.
Sept. 19.
Steel Shelving. Extended to
Oct. 17.
Tools, Optical Supplies,
Scientific Apparatus. Oct. 9.

SYDNEY COUNTY COUNCIL.

Aluminium Brass Condenser
Tubes and Ferrule Tubing, for
Bunnerong "A" Power Station
(Spec. 1454). Extended to Sept.
28.
Concrete Conveyors (2). Sept.
22.
M.S. Welded Tanks, Miscellan-
eous, for Bunnerong "B" Power
Station (Spec. 1465). Oct. 5.
Precipitron Electro Static Air
Cleaning Equipment. Sept. 21.
Thermostats (250), 20 amp., 250
volt. Sept. 18.

METROPOLITAN WATER, SEWERAGE AND DRAINAGE BOARD.

C.I. Pipes, Spigot and Socket
Pipe Fittings, Stop Valves, Reten-
tion Valves and Spring Hydrants
(Job 2450). Oct. 3.
Sewerage Ejector, pneumatically
operated (Job 2966). Sept. 26.

(Turn to page 79.)

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Ferobestos Technical Plastics are manufactured in standard and special grades. These have varying composition and properties, but the following characteristics are common to all of them: high strength in relation to weight, high resistance to heat and chemical action, low moisture absorption, low starting and running friction, and fair electrical resistance. The

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BASE	Asbestos non-woven	Asbestos Cloth Heavy Weave	Asbestos Cloth Fine Weave	Asbestos Composition
Tensile Strength (lb./sq. in.)	18,000	7,000	12,000	9,000
Compressive Strength (lb./sq. in.)	30,000	34,000	43,000	35,000
Shear Strength (lb./sq. in.)	15,000	10,000	13,000	9,000
Cross-breaking Strength (lb./sq. in.)	33,000	11,500	19,000	15,000
Impact Strength (ft./lb.)	3	2.5	4	1.0
Fatigue Strength (tons/sq. in.)	3.75	1.0	2.25	—
Density (gm./c.c.)	1.67	1.67	1.74	1.75

Tests carried out under B.S.S. or other approved specification

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A Member of the Turner and Newall Organisation

NEW TENDERS — Contd.

GOVERNMENT RAILWAYS DEPARTMENT.

Aluminium Window Frames and Doors (Quote CE-2216). Sept. 19.

MISCELLANEOUS.

Auto Patrol Grader, Purchase of, from Municipality of Glen Innes. Sept. 25.

Concrete Mixers, 2-7 cubic ft. and 2-3 cubic ft. cap., petrol engine driven, for Hunter District Water Board. Sept. 20.

Diesel Engine, 30 - 40 h.p., for Municipality of Shell Harbour. Sept. 20.

Heavy Bulldozer, Blade not less than 10 ft., for Shroud Shire Council. Sept. 25.

Motor Road Graders (3), Diesel-powered and weighing between 15,000 and 18,000 lbs., for Shire of Goobang. Oct. 18.

♦ ♦ SEE ALSO ♦ ♦
"LATE OPEN TENDERS"

Overhead Loader, for T.D.9 Tractor, and Overhead Loader, complete, with Tractor, for Shire of Carathool. Oct. 11.

Radio Communication System, 2-way, for the City of Goulburn. Sept. 28.

Reinforcing Steel:—5 tons 1 in. dia. bars; 15 tons 1 in. dia. bars, 5 tons 1 in. dia. bars, for Namoy Shire Council. Oct. 2.

VICTORIA

DEPARTMENT OF PUBLIC WORKS.

Central Heating and Hot Water System, for Kiewa Valley. Sept. 26.

Central Heating Equipment, for Yallourn. Sept. 26.

Fuel Hot Water Service, for Mudgegonga. Sept. 26.

Fuel Hot Water Service, for Lardner. Oct. 3.

Fuel Hot Water Service, for Rutherglen. Sept. 26.

Kerosene Hot Water Service, for Myrtleford. Sept. 19.

Kerosene Hot Water Service, for Narre Warren North. Sept. 26.

Master and Slave Clock System, for Caulfield. Sept. 19.

Tractors (2), four stroke Diesel, fitted with D.D.U.s., Universal dozers, preferably Hydraulic-operated, for Fort Melbourne. Sept. 19.

(Turn to page 80.)

THE PINNACLE OF ACHIEVEMENT IN AUTOMOTIVE VALVE ENGINEERING

D.E.C. BRAND AUTOMOTIVE STATIONARY AIRCRAFT



VALVES

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NEW TENDERS - Contd.

GOVERNMENT RAILWAYS DEPARTMENT.

- Disc Insulators. Oct. 18.
Galvanised Fencing Wire. Nov. 1.
Hydraulic Angling and Filling Dosers. Sept. 27.

MELBOURNE AND METROPOLITAN BOARD OF WORKS.

- Armoured Cable. Sept. 26.
Steel Matting (150 tons), for Tunnel Laying. Sept. 26.

Stoneware Pipes (Salt-glazed), and Pipe Fittings. Sept. 26.

MELBOURNE HARBOUR TRUST.

- M.S. Sections and Plates (approx. 163 tons). Oct. 6.
Mobile Crane (3 ton), slewing type. Oct. 20.
Mobile Crane (10 ton), slewing type, with 40 ft. jib. Oct. 20.

DEPARTMENT OF WORKS AND HOUSING.

- Asbestos Cement Sheets (18,000) flat, 9 ft. x 4 ft. x 3/16 ins.; Corrugated Asbestos Cement Sheets

(72,000), 3 ft. 5 1/2 in. x 1 in.; Fibre Nails (70 cwt.), 1 in. x 14G; Screws, 25,500 (Sets), with washers, for various States. Sept. 28.

Dormant Platform Scales (3), and one Portable Platform Scales, for Portland. Sept. 26.

Electric Generating Sets, 5 K.V.A., petrol engine driven, for West Melbourne. Sept. 26.

Wool Stacking Machines (3), for Portland. Sept. 26.

REPATRIATION DEPARTMENT.

Canvas Laundry Bags. Sept. 19.

POSTMASTER-GENERAL'S DEPARTMENT.

Wheeler Bins (Sch. V.395). Oct. 3.

STATE ELECTRICITY COMMISSION.

Oil Fired Steam Boilers (Spec. 50-51/83). Extended to Sept. 20.

Rotary Shears, Plate Splitting Shears, and Punching Machine (Spec. 50-51/93). Oct. 11.

Transformers (00 kv. and 22 kv.), (Spec. 50-51/3). Extended to Oct. 11.

Warm Air Heating and Ventilating System (Spec. 50-51/93). Oct. 4.

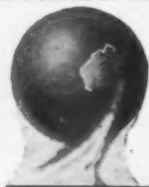
(Turn to page 81.)

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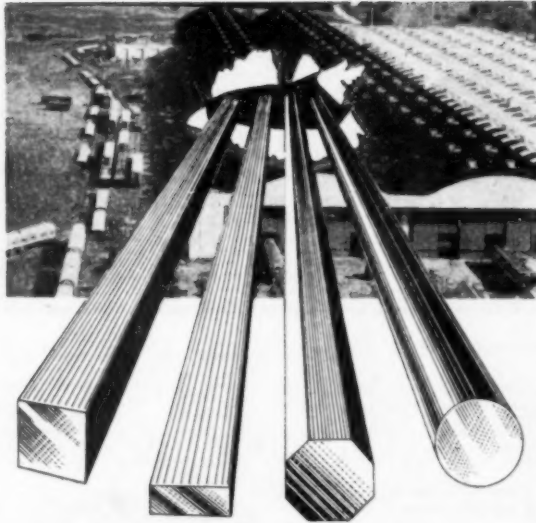
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NEW TENDERS - Contd.

CITY OF MELBOURNE.

Degreasing Plant, Sept. 19.
Fabricated Structural Steelwork
(Spec. 756/E), Oct. 9.

MISCELLANEOUS

Annual Supplies: Cement,
Lubricating Oils, Fuel Oils, Kero-
sene, R.C. Pipes, for the City of
Box Hill, Sept. 22.
Automatic Traffic Control
Lights, for City of Nunawading,
Sept. 18.

Filtration and Chlorination
Plant, for Shire of Birechip, Oct.
16.

Front End Loader, mounted on
Rubber-tyred Tractor, for the
Shire of Donald, Sept. 18.

Galvanised Iron Fencing and
Gates, for City of Collingwood,
Sept. 18.

Materials: Cast Iron, Asbestos
Cement, for R.C. Pipes; C.I. Pipe
Specials and Valves, for Elmor
Water Works Trust, Sept. 20.

Power-driven Pick-up Road and
Channel Sweeper, for City of
Caulfield, Sept. 18.

Power Loader, half cu. yd. cap.,
operated by Power Unit, Portable,
and mounted on Pneumatic Tyres,
for the Shire of Wodonga, Sept.
25.

WEST AUSTRALIA

GOVERNMENT TENDER BOARD.

Air Compressors and Receivers,
for Brookdale, Sept. 21.

Blackiron Catwalk Flooring
Units and Stair Treads, for Brick-
works, Sept. 21.

Bore Casing, 5, 6 and 10 inch,
Sept. 28.

Calorifier, 250 gallon, for Fre-
mantle Hospital, Sept. 21.

Concrete Mixing Plant, for Ord
River, Sept. 28.

Copper Cable, for S.E.C. Sept.
28.

Emery Grinder and Polishing
Machine, for Fremantle School,
Sept. 21.

Fork Lift Trucks, for State
Brickworks, Extended to Oct. 19.

CURRENT TENDERS

The following tenders have
appeared in previous issues
and are still current.

COMMONWEALTH

POSTMASTER-GENERAL'S DEPARTMENT.

Bells and Buzzers (Sch. C-
6352), Sept. 21.

Bimotional Switch Armatures
and Associated Parts (Sch. C-
6356), Sept. 21.

Braded Switchboard Cable (Sch.
C.6355), Oct. 12.

Cable Identification Sets (Sch.
C.6409), Oct. 17.

Compressed Gas Equipment
(Sch. C.6405), Sept. 21.

(Turn to page 82.)



HOUSEHOLD AND INDUSTRIAL ADHESIVE

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quart, gallon and 4-gallon tins

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Reliance Trading Co., Hobart, Tas.

ORMISTON RUBBER CO.

Moonee Ponds, Victoria

Industrial Diamonds GUTWIRTH & SONS PTY. LTD.

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CURRENT TENDERS — contd.

Communication System between Sydney and Melbourne (Spec. C-8157). Extended to Jan. 18, 1951.
Cords, Switchboard Types (Sch. C.6372). Oct. 12.
Dial Parts (Sch. C.6338). Oct. 3.

Distributing Frames and Terminal Equipment (Sch. C.6378). Oct. 19.

Eyebolts and Eyebolt Lugs (Sch. C.6415). Oct. 19.
Galvanised Iron Sheets (Sch. C-6383). Oct. 5.

Induction Coils (Sch. C.6391). Nov. 2.

Intercommunication Telephones (Sch. C.6384). Nov. 2.

Jacks and Number Plates (Sch. C.6359). Oct. 19.

Maintenance Parts, for Telephone Equipment (Sch. C.6314). Oct. 5.

Mechanics Tools, Gauges, etc. (Sch. C.6411). Nov. 23.

Motor Vehicle Batteries (Sch. C.6403). Sept. 21.

Outside Broadcasting Amplifiers and Associated Equipment (Sch. C.6400). Sept. 21.

Pipes, G.I. & B.I. (Sch. C.6393). Sept. 26.

Pliers and Screwdrivers (Sch. C.6418). Nov. 30.

Plugs (Sch. C.6363). Oct. 19.

Portland Cement (Sch. C.6414). Oct. 12.

Printed Forms, Telephone Order Forms in rolls and pads (Sch. C-6412). Sept. 21.

Printed Forms, Miscellaneous Series (Sch. C.6413). Sept. 21.

Rectifiers, Telegraph No. 1 (Sch. C.6408). Sept. 21.

Semi Automatic Trunk Exchange Equipment, for Sydney Trunk Exchange (Sch. C.6025). Extended to Sept. 26.

Switchboard Keys (Sch. C.6404). Nov. 16.

Telephone Meters (Sch. C.6390). Nov. 9.

Tools, for Mechanics, Exchange and Sub-station Maintenance (Sch. C.6416). Nov. 30.

Transformers (Sch. C.6398). Nov. 16.

Transmitting Tubes (Sch. C-6353). Sept. 26.

AUSTRALIAN ALUMINIUM PRODUCTION COMMISSION.

Mild Steel Plates and Sections, approx. 1,000 tons. Sept. 25.

Inclined Belt Conveyors (2), galleries and supporting structures (Spec. M.20). Oct. 18.

Road Transport Weighbridge (Spec. M.19). Oct. 9.

Travelling Weighing Hopper and three (3) cwt. Platform Scales (Spec. M.21). Oct. 16.

Worm Reducing Drive (Spec. CH.7). Oct. 2.

DEPARTMENT OF CIVIL AVIATION.

Approach Light Fittings, high intensity (Sch. 308). Nov. 14.

Rotating Light Beacons, for Airport (Sch. 307). Nov. 14.

Voice Frequency Telegraph Equipment (Sch. 303). Sept. 19.

DEPARTMENT OF PUBLIC WORKS.

Transformers. Sept. 26.

Water Treatment Plant, for Nowra. Oct. 3.

DEPARTMENT OF THE INTERIOR.

Petrol Bowsers (2), electric type, without motors, Purchase of. Sept. 20.

Underground Storage Tanks (2), 500 gallon, Purchase of. Sept. 20.

DEPARTMENT OF SUPPLY AND DEVELOPMENT.

Tools and Gauges. Sept. 21.

DEPARTMENT OF WORKS AND HOUSING.

Galv. Steel Sheets, various sizes and gauges, approx. 800 tons (Item 26). Aug. 29.

Gas Supply Unit, Reticulation and Accessories, for Dental Centre. Sept. 19.

Heating and Hot Water System, for University. Sept. 26.

High Tension Underground Cable Joint Boxes. Sept. 19.

Hot Water Calorifiers (2), 450 gall. Sept. 19.

Low Tension Underground Cable and Cable Joint Boxes. Sept. 19.

Truck Switchboard (11 KV), five panel. Sept. 19.

GOVERNMENT RAILWAYS DEPARTMENT.

Crossings, for 80 lb. rails. Sept. 19.

Diesel Powered Rail Cars, 4 ft. 8 1/2 in. gauge. Oct. 3.

(Turn to page 83.)

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**WILL SOLVE
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If you have a surface coating problem, it is wise to take full advantage of Lusteroid's unrivalled experience. Years of laboratory research enable the Lusteroid representative to give really worthwhile technical assistance. Whatever your protective problem may be, Lusteroid has the right answer.

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Agencies, 218 Maitland Road, Newcastle.

CURRENT TENDERS - contd.

STATES

NEW SOUTH WALES

**GOVERNMENT RAILWAYS
DEPARTMENT.**

Automatic Milling Machine
(Quot. CE-1271). Sept. 28.

Centre Lathe, 6 inch, medium
duty (Quot. CE-1124). Sept. 28.

Centre Lathe, 8 1/2 inch, heavy
duty (Quot. CE-1123). Sept. 28.

Coil Winding Machine, for
layer winding of elect. coils
(Quot. CE-1130). Sept. 28.

Compression Ignition Oil En-
gines (10), high speed, multi cylin-
der, 500 B.H.P., vertical or vee
type (Spec. 2205). Sept. 27.

Cotton Duck (Quot. CE-5050).
Oct. 3.

Disconnecting Switches (Quot.
CE-1299). Nov. 23.

Drilling Machine, Pillar type, to
drill 1 1/2 ins. (Quot. CE-1126). Sept.
28.

Electric Overhead Travelling
Crane (75 ton), (Spec. 504). Ex-
tended to Nov. 1.

Engraving Machine (Quot. CE-
1131). Sept. 28.

Explosives (Sch. 119). Sept. 20.

Finishing Machine, 4 inch, hori-
zontal (Quot. CE-1272). Sept. 26.

Hand Trucks, for Oxy-acetylene
Cylinders (Quot. CE-6042). Sept.
15.

Metal Cleaning Compound (Sch.
1931). Sept. 20.

Motorised Band Sawing Machine
(18 inch), (Quot. CE-1129). Sept.
28.

Motorised high speed Sensitive
Drill, 1 inch capacity (Quot. CE-
1127). Sept. 28.

Polishing Head, motorised,
double ended (Quot. CE-1273).
Sept. 28.

Power Hacksawing Machines
(Quot. CE-1128). Sept. 28.

Rolled Steel Tramway Tyres
(Sch. 130). Sept. 20.

Sensitive Radial Drilling Ma-
chine, spindle radius, 36 inch
(Quot. CE-1125). Sept. 28.

Steel Hardening Compounds
(Sch. 182). Sept. 20.

Tool Post Grinder (Quot. CE-
1274). Sept. 28.

Tumblers and Water Bottles
(Sch. 120). Sept. 20.

Turntable Girders and Fittings
(2), Welded Steel. Sept. 20.

Welded Steel Turntable Girders
(2), and Fittings. Sept. 20.

Wood Boring Machine, motor
driven (Quot. CE-1311). Sept. 27.

**COUNCIL OF CITY OF
SYDNEY.**

Footway Rollers (3), 1 1/2 ton.
Sept. 22.

**DEPARTMENT OF MAIN
ROADS.**

Ball Bearing Castors. Sept. 19.

C.I. or Steel Pipe Spreaders.
Sept. 19.

Earth Boring Machine. Sept.
19.

Fire Tiles. Sept. 19.

Jackhammer Parts. Sept. 19.

Pallaseses. Sept. 19.

Pneumatic Concrete Vibrator.
Sept. 19.

Turnbuckles. Sept. 19.

Wire Stretchers. Sept. 19.

**DEPARTMENT OF PUBLIC
WORKS.**

Are Welding Plant. Sept. 20.

Block Dies. Sept. 22.

Booster Pumping Plant, elect.
driven, for Muswellbrook. Oct. 9.

Bracket Light Fittings. Sept.
20.

Caps and Linings. Sept. 22.

Chain Wire Mesh. Sept. 20.

Chemical Feeders. Sept. 22.

Conduit Dies. Sept. 22.

Copper Sheet. Sept. 22.

Derrick Cranes, elect. driven,
stiff leg (40 ton), for Clarence
River Works. Oct. 16.

Deep Well Pumping Plant,
Elec. Driven (82-49/50), for Gun-
nedah Water Supply. Sept. 18.

Door Closer Springs. Sept. 22.

Effluent Pumping Unit. Sept.
20.

Elec. Driven Overhead Travel-
ling Cranes and Gantry, for Clare-
nce River Works (Con. 70-49/50).
Sept. 18.

Electric Water Heater. Sept.
22.

Flue Pipe. Sept. 20.

Fluorescent Fittings. Sept. 20.

Floor Tiles. Sept. 22.

Gas Heater. Sept. 22.

Gas Pie Warmer. Sept. 20.

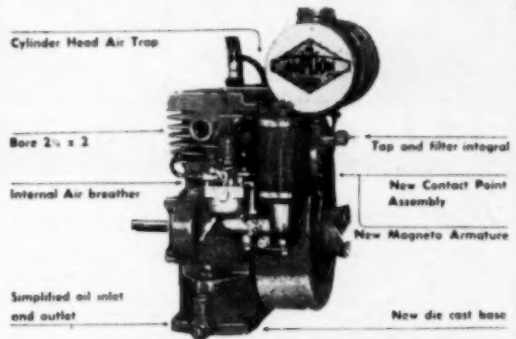
Grill Flooring. Sept. 22.

Hoist (5 ton capacity). Sept.
22.

Lighting Units. Sept. 20.

Pumping Plant, elect. driven,
(Turn to page 84.)

**NEW RELEASE of amazing
40 lb. 2 1/2 Horse power Petrol Engine!**



Opens up an entirely new field for operating pumps,
portable power tools, generating plants, etc.

LIST PRICE: £39/10/-
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GEAR WITHIN A GEAR PRINCIPLE
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CURRENT TENDERS - contd.

for Forbes Water Supply. Oct. 23.
Rate Control Valve. Sept. 22.
S.S. Table. Sept. 20.
Sewerage Pumping Plant, elect. driven, for Murwillumbah. Sept. 25.
Sink. Sept. 22.
Spraying Enamel and Undercoat. Sept. 22.
Steel Roller Shutter. Sept. 22.
Stocks, Dies and Taps. Sept. 22.
Syphon Pot. Sept. 20.
Tank Materials. Sept. 22.
Tiles. Sept. 22.
Transformers, 250 K.V.A. Extended to Sept. 20.
Water Softener. Sept. 20.
Water Filtration and Softening Plant, for Carcoar District Hospital. Oct. 9.

DEPARTMENT OF WORKS AND HOUSING.

Steel Tables (40), for Roselle. Sept. 19.

MARITIME SERVICES BOARD.

Fluorescent Lighting Fittings. Oct. 9.
Metal Cutting Band Saw. Oct. 3.

METROPOLITAN WATER, SEWERAGE AND DRAINAGE BOARD.

C.I. Penstocks (3), 10 ft. diameter (Job 2447). Extended to Oct. 31.
Diamond Drills (4), hydraulic feed type, and Drilling Equipment (P.T.384). Oct. 10.
Fluorescent Light Fittings (Con. 2417). Sept. 19.

SYDNEY COUNTY COUNCIL.

Fork Lift Loaders and Stackers (Spec. 1447). Sept. 21.
Glass Symmetrical Holophane Refractors, for street lighting units (100). Sept. 18.
Insulators and Fittings, for Outdoor Service (Spec. 1435). Oct. 12.
Insulating Oil, for Electrical Purposes (Spec. 1458). Sept. 28.
Machine Tools (Spec. 1464). Sept. 28.
Motor - driven Front End Loader, for Pyrmont "A" Power Station (Spec. 1459). Sept. 21.
Oil Immersed Fuse Switches, 11,000 volt. (Spec. 1421). Sept. 28.
Power Transformers (45 MVA), for Homebush Sub-station (Spec. 1419). Extended to Sept. 28.
Single Core Cable, 33,000 volt. (Spec. 1451). Sept. 21.
Solenoid Operating Mechanisms, for oil circuit breakers (Spec. 1452). Oct. 28.
Storage Batteries and Battery Charging Equipment, for Sub-stations (Spec. 1446). Oct. 28.
Turbine Blading for Bunnerong Power Station (Spec. 1455). Sept. 21.

MISCELLANEOUS.

Carbonizing Plant, for City of Armidale. Sept. 30.
Carbonizing Plant, consisting of vertical retorts, for Bathurst City Council. Oct. 31.

(Turn to page 85.)

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GRAIN ELEVATOR BOOT
Capacity: 300 tons per hour

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S.A.: Power Plant Ltd., 180 Currie St., Adelaide. (Cent. 4432)

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Materials Handling Division, 121-7 Lonsdale Street, Melbourne (JM 1993)

CURRENT TENDERS — contd.

Emulsion and/or Bitumen
Sprayer, for Shire of Nambucca.
Sept. 18.

Mechanical Loader, 3-11 cu. yd.
bucket capacity, for Shire of Yal-
lariol. Oct. 11.

Medium Grader, Diesel Powered,
and Excavator, suit Water and
Sewerage Trenching, for Muni-
cipality of Kempsey. Sept. 18.

Metalclad Switchgear, 11,000
volt, for Newcastle City Council.
Extended to Oct. 9.

Oil Circuit Breakers (8), 500
MVA, 33 KV, for Greater Wollon-
gong City Council. Extended to
Oct. 24.

Outdoor Oil Circuit Breakers
(11), 33,000 volt, for Newcastle
City Council. Oct. 30.

Pipes (4 and 6 inch), for Trunk
Mains; Pipes, 4 and 6 inch, for
Reticulation Mains; Valves and
Fittings, for Reticulation Pipes,
for Central Tablelands County
Council. Sept. 25.

Plant:—Diesel Grader, heavy
duty, tandem drive; Pneumatic-
tyred Tractors (2), small, with
bulldozer blade, scoop and ripper;
Front End Loader, for attachment
to Tractor, for Shire of Cudge-
gong. Sept. 18.

Power Graders (2), approx. 40
hp., and 13,000 lb. weight, for
Conargo Shire Council. Sept. 20.

Radio Communication System,
two-way, for City of Goulburn.
Sept. 28.

Road Plant:—Front End
Loader, with crawler tracks; Road
Roller, Diesel powered, 6/8 ton;
Diesel powered Excavator, with
shovel equipment and 1 cu. yd.
bucket; Medium Grader (weight
over 12,000 lb.), powered with
Diesel or kerosene motor, for
Shire of Blacktown. Sept. 20.

Second-hand Plant:—P o w e r
Grader, with power controls, 16-
feet Blade; Scarifier, Block, etc.
(weight approx. 6 tons); Power
Grader, manual controls, 16-feet
Blade, Scarifier, Block, etc.
(weight approx. 6 tons), Purchase
of, from Shire of Hume. Sept. 20.

Transformers (3), outdoor plat-
form type, 100 KVA, 11 KV/415/

340 volts, 3-phase, for Muni-
cipality of Quesanbeyan. Sept. 23.

VICTORIA

GOVERNMENT RAILWAYS DEPARTMENT.

Aluminium Brass Tubes, solid
drawn. Sept. 20.

Copper Cables. Sept. 27.

Furnace Oil. Sept. 20.

Lathe, Sliding, Surfacing and
Screw Cutting. Sept. 27.

Mild Steel Frame. Sept. 27.

Mobile Cranes, petrol electric.
Oct. 4.

Pin Type Porcelain Insulators
(30 K.V.). Oct. 4.

Telephone Cable. Sept. 27.

CITY OF MELBOURNE.

Front End Loader, petrol driven.
Sept. 19.

Isolating Switches, 440 volt.
(Spec. 731/E). Sept. 28.

L.T. Oil Circuit Breakers and
Current Transformers (Spec. 732/
E). Sept. 25.

M.S. Pipework and Supports,
for Fuel Oil Storage System
(Spec. 734/E). Oct. 2.

Street Lighting Lanterns (Spec.
735/E). Dec. 4.

COUNTRY ROADS BOARD.

Power-driven Winches (5),
double drum, for lifting 2 ton
drop hammer. Sept. 25.

Power-driven Winches (3),
single drum, for lifting 2 ton drop
hammer. Sept. 25.

DEPARTMENT OF PUBLIC WORKS.

Central Heating System, for
Collingwood. Sept. 28.

Fuel Hot Water Service, for
Caladu. Sept. 19.

Kerosene Hot Water Service, for
Corrong. Sept. 19.

Kerosene Hot Water Service, for
Beechworth. Sept. 19.

Kerosene Hot Water Service, for
Euroa. Sept. 19.

Kerosene Hot Water Service, for
Meyhu. Sept. 19.

Kerosene Hot Water Service, for
Welschpool. Sept. 19.



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and Co.; Eric Grahame & Co. Q.L.D.: Engineering Supply Co. of Aust.
Ltd. VIC.: A. H. Gibson (Elec.) Co. Pty. Ltd.; Koop Bros. & Wood
Pty. Ltd. S.A.: Cornhill Limited. W.A.: Atkins (W.A.) Limited.
TAS.: A. H. Gibson Elec. (Tas.) Pty. Ltd.; E. A. Machin & Co. Ltd.

DISTRIBUTORS:

DEPARTMENT OF WORKS AND HOUSING.

Electric Passenger Lift, for
South Yarra. Sept. 19.

Hot Water Supply System, for
Canberra. Sept. 28.

Oil Burning Installation, for
Parkville. Extended to Sept. 19.

Steelwork and Brasswork, for
Cable Support, for Melbourne.
Oct. 10.

STATE ELECTRICITY COM- MISSION.

Attachments, for Tractors (Spec.
50-51/91). Sept. 27.

Belt Conveyor System (Spec.
50-51/4). Extended to Sept. 20.

Centrifugal Pumps, electric mo-
tor driven (Spec. 50-51/93). Oct.
18.

(Turn to page 86.)

32 YEARS OF GENERATOR PROGRESS by DURST MOTORS



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1918

We can now supply without delay this highly-efficient unit—DURST dependable generators—write or 'phone us your requirements.



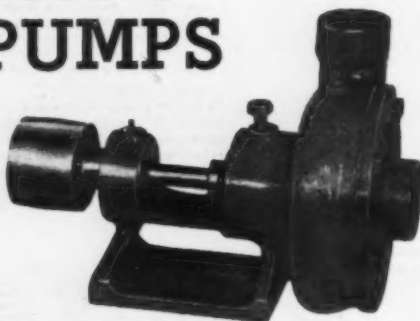
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CURRENT TENDERS — contd.

Distribution Transformers, 6,000 volt., and 22,000 volt. (Spec. 50-51/19). Sept. 27.

Flanged Steel Pipes and Fittings (Spec. 50-51/64). Oct. 18.

Fork Lift Trucks (Spec. 50-51/88). Sept. 27.

Lifting Masts, steel and timber (Spec. 50-51/80). Sept. 27.

Outdoor Switches and Accessories, 22 kV and 66 kV (Spec. 50-51/44). Nov. 1.

Structural Steelwork for 10 ton crane gantry (Spec. 50-51/50). Sept. 27.

Trailing Cable, V.R.L. T.R.C.S., 8.6 K.V. (Spec. 50-51/68). Nov. 15.

Transformers and Spares, 6,000 KVA (Spec. 50-51/85). Sept. 27.

STATE RIVERS AND WATER SUPPLY COMMISSION.

Structural Steelwork for girders and handrails. Oct. 10.

MISCELLANEOUS.

Annual Stores: Cement; Hardware; Lubricating Oils; Concrete Pipes and Sections and Motor Spirit, for City of Williamsstown. Oct. 1.

Automatic Control Lights (traffic), for City of Camberwell. Sept. 23.

Annual Supplies:—Motor Spirit; Lubricating Oils, Commercial Oils and Greases; Kerosene, lighting and power distillate, Fuel oil; Portland Cement, for City of Brunswick. Sept. 18.

C.I. Asbestos Cement or R.C. Pipes, C.I. Pipe Specials and Valves, for Elmore Waterworks Trust. Sept. 20.

Heavy Diesel Power Grader, for Shire of Charlton. Sept. 22.

Materials: Ironmongery; Motor Spirit; Power Kerosene; Fuel Oils; Lubricating Oils and Greases, for City of St. Kilda. Sept. 21.

Pressure Water Pipes and Fittings (12 inch), 16,000 ft., for Hordsham Waterworks Trust. Oct. 2.

Transformers, for City of Footscray. Sept. 25.

Water Filtration and Chlorination Plant and Vacuum Cleaning Apparatus, for Shire of Rutherglen. Oct. 4.

QUEENSLAND

BRISBANE CITY COUNCIL.

Earth Hole Boring Machine. Sept. 22.

O.H. Travelling Crane. Sept. 15. Piping, h.p. steam, feed, drain, and blowdown, valves and lagging. Oct. 20.

Ring Main Switchgear, 11 kV. Oct. 20.

Rotary Mechanical Scrapers, Rotary Distributors and Floating Covers. Sept. 22.

Underground Cable, 11,000 v. and 600 v.; Pilot Cable and Jointing Material. Sept. 22.

(Turn to page 87.)

CURRENT TENDERS — contd.

STATE ELECTRICITY COMMISSION.

Air Break Switches and Earth Leakage Protection Equipment (Spec. 233). Oct. 25.

Coal Burning Gas Producers (3), (Spec. 227). Oct. 18.

Coal Burning Gas Producers (3), (Spec. 228). Oct. 18.

Distribution Materials (Spec. 245). Nov. 1.

Hard Drawn Bare Copper Cable (Spec. 243). Oct. 25.

Insulators and Insulator Iron-work (Spec. 244). Oct. 25.

Switchgear: (132, 66, 22, 11 & 5 KV), Relays and Carrier Current Communication Equipment (Spec. T.F./3). Dec. 13.

Transformer, 33/11 KV and Regulator (Spec. 223). Sept. 27.

Transformers, 3 phase and single phase (Spec. 241). Dec. 6.

Water Tube Boilers (Spec. 224). Oct. 25.

Water Tube Boilers (Spec. 200). Extended to Sept. 27.

MISCELLANEOUS.

Engine-driven Alternator Sets (2), 750 KW, complete, for Cairns Regional Electricity Board. Oct. 11.

Switchgear, Relays and Instruments, for Cairns Regional Electricity Board. Dec. 6.

SOUTH AUSTRALIA

DEPARTMENT OF WORKS AND HOUSING.

Exhaust Hood (Spec. 329), for Central South Australia. Sept. 19.

Fencing (approx. 15 miles), for Renmark Aerodrome. Sept. 19.

GOVERNMENT RAILWAYS DEPARTMENT.

Hopper Waggon (20), 25 tons, for Islington Workshops. Sept. 28.

WEST AUSTRALIA

GOVERNMENT TENDER BOARD.

Diesel Mechanical Shunting, Locomotives. Oct. 5.

Forging Machine, for Railways. Nov. 16.

Lathe, Grinders, Welders, Drills, Air Compressors, for Railways Dept. Oct. 12.

Motors and Starters, for S.E.C. Sept. 28.

Railway Car and Waggon Tyres. Oct. 12.

Sluice Valves (15 & 21 inch), for Mt. Yokine Reservoir. Sept. 28.

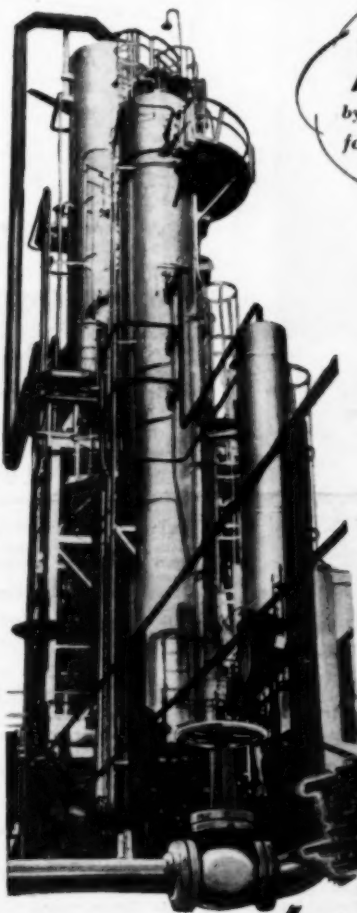
Steel Sections, for Railways. Nov. 18.

Steel Work for New Perth Causeway. Sept. 21.

Transformer (50 KVA), for Norseman. Sept. 28.

(Turn to page 88.)

WHEN IT'S WELDING—AUSTRALIA'S BASIC INDUSTRIES LOOK TO LINCOLN



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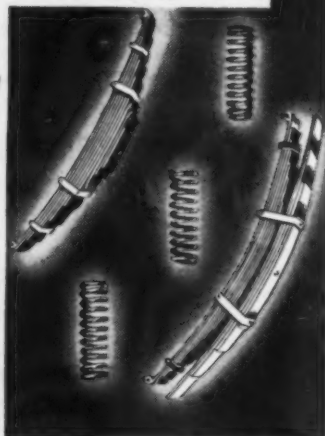
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CURRENT TENDERS — contd.

TASMANIA

MISCELLANEOUS.

Materials:—C.I. or Asbestos Cement Pressure Pipes; Valves; C.I. Pipe Specials; Pumping Plant, for Municipality of Kentish. Oct. 9.

NEW ZEALAND

HYDRO-ELECTRIC DEPARTMENT.

Synchronous Condensers (2), 30,000 KVA. Nov. 21.
Transformer Bank and Spare Unit, 10,000 KVA. Oct. 3.
Transformer Banks and Spare Units (2), 50,000 KVA. Oct. 10.

MISCELLANEOUS.

Dredger, with pipelines, pontoons and accessories, for Nelson Harbour Board. Sept. 18.
O.H. Electric Cranes (9), 2-ton, for Wellington Harbour Board. Oct. 4.

Sewerage Pumps (2), electric motor driven, and fittings, for Wellington City Council. Sept. 29.

Late Open Tenders

COMMONWEALTH

DEPARTMENT OF PUBLIC WORKS.

Air or Steam Hose. Sept. 29.
Circular Saw Spindle. Sept. 29.
Malthoid. Sept. 29.
Runway Trolley. Sept. 29.
Stocks and Dies. Sept. 29.
Stud Link Cable. Sept. 29.
Wire Clips. Sept. 29.

DEPARTMENT OF CIVIL AVIATION.

VHF/FM Receivers. (Sch. 305). Sept. 19.

DEPARTMENT OF WORKS AND HOUSING.

Automatic Washing Machines (6). Sept. 20.
Transformers (8), (4) 100 K.V.A., and (4) 50 K.V.A., for Canberra. Oct. 24.

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DEPARTMENT OF SUPPLY.
Cooling Machinery. Oct. 2.
Diesel Electric Generating Equipment. Sept. 28.
Lighthouse Optical Apparatus. Sept. 29.
Radio Beacon Equipment. Sept. 26.

Transformers (2), 10,000 K.V.A., 33,000-volt, and (3), 5,000 K.V.A., 33,000-volt, for Newcastle City Council. Oct. 30.

VICTORIA

STATE RIVERS AND WATER SUPPLY COMMISSION.

Electric Refrigerator, 100 cu. ft. capacity. Sept. 28.

MISCELLANEOUS.

Low Level Loader, for transport of track tractor of nine tons weight, for Shire of Belfast. Sept. 21.
Pressure Water Pipes, 5,000 ft. of 11 in. int. diameter, and 22,000 ft. of 4 in. int. diameter, for Geelong Water Works and Sewerage Trust. Sept. 21.

QUEENSLAND

BRISBANE CITY COUNCIL.
Stationary Batteries and Charging Equipment (150 amp. hours). Oct. 20.

IRRIGATION AND WATER SUPPLY.

Excavated Tank and Incidental Works (Job 1656). Sept. 18.
Excavated Tank and Incidental Works (Job 1667). Sept. 18.
Excavated Tank and Works (Job 1716). Sept. 28.

(Turn to page 89.)

NEW SOUTH WALES

METROPOLITAN WATER, SEWERAGE AND DRAINAGE BOARD.

Sawdust and Shavings Extractor, maximum cap. 1-ton per hour; Incinerator Plant, capacity approx. 5 tons per day, for Warragamba Dam (P.T. 378). Oct. 17.

GOVERNMENT RAILWAYS DEPARTMENT.

Bogie Liners (Quot. CE-6081). Sept. 28.
Carriages, for Typewriters (Quot. CE-6085). Sept. 20.
R.C. Pipes (Sch. No. 129). Sept. 27.
Transformers (24), 2 KV, 415 v., ranging from 50 KVA to 500 KVA (Spec. 1273). Oct. 23.

DEPARTMENT OF MAIN ROADS.
Diesel Fuel Pump and Lubricating Oil Filters. Sept. 21.
H.S. Slot Drills. Sept. 21.

MISCELLANEOUS.

Electric Adding Machines (2), for Municipality of Fairfield. Sept. 25.



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LATE OPEN TENDERS—Contd

DEPARTMENT OF CO-ORDINATOR GENERAL OF PUBLIC WORKS.

Spillway Gates (8), Sector Type, 20 ft. x 23 ft., for Somerset Dam. Nov. 27.

DEPARTMENT OF RAILWAYS—NEW SOUTH WALES.

TENDERS enclosed in sealed envelopes which must be endorsed "TENDER FOR . . .", addressed to the Commissioner for Railways, 19 York Street, Sydney, will be received on the date and time shown for services specified. Tenders may be lodged in the Tender Box, Room 504A, 5th Floor, Railway House, 19 York Street, Sydney, or posted to the above address.

Wednesday, 25th October—12 noon.

For the supply of twenty-four 2 KV-415-v. Transformers, ranging from 50-KVA to 500-KVA, to Specification No. 1273, for the Eastern Suburbs Railway. Copies, price 2/6, obtainable from Chief Electrical Engineer, 19 York Street, Sydney.

No tenders necessarily accepted. Make cheques payable to Commissioner for Railways. Any tender unaccompanied by deposit as provided in conditions of contract may be rejected.

S. R. NICHOLAS,
Secretary for Railways.

STATE ELECTRICITY COMMISSION.

Fabricated Steelwork (Spec. 235). Oct. 18.

Main Transformers, 182, 06, 22, 11 and 5.5 kV. (Spec. T/F.2). Dec. 13.

Radio Communication Equipment (Spec. 237). Oct. 4.

Steam Turbo Alternators (Spec. 200), for Townsville and Wide Bay Regional Electricity Board. Sept. 27.

Turbo-Alternators (2), water-driven, 11,000 V., 18,000 kW (Spec. T/F.1). Nov. 29.

MISCELLANEOUS.

Alternators (2), Crude Oil Engine Driven, 100 h.p. engine; Switchboard, Air Receiver, Compressor and Spares, for Cairns Regional Electricity Board. Oct. 24.

End Loader Unit, 2/3 cu. yd. cap., hydraulically operated, for Nanango Shire Council. Sept. 22.

Miscellaneous Materials: Pipes and Fittings, various sizes; Special Pipes, Valves and Fittings, various sizes; Centrifugal Pumps; Electric Motors and Equipment, for Bundaberg City Council. Oct. 9.

Roadmaster Grader, 12 ft. Blade, and Scarifying Equipment, Purchase of, from South Coast Town Council, Southport. Sept. 22.

SOUTH AUSTRALIA

CITY OF ADELAIDE.

Front End Loader, 2 to 1 cubic yd. cap. Sept. 29.

Mobile Air Compressor. Sept. 22.

SUPPLY AND TENDER BOARD.

M.S. Plates (12,678 tons). Sept. 18.

TASMANIA

MISCELLANEOUS.

Asbestos Cement, or C.I. Pipes (Con. W-9), for Port Cygnet Municipal Council. Sept. 18.

Pressure Pipes, Asbestos Cement or C.I. (Con. W-9), for Longford Municipal Council. Sept. 18.

NEW ZEALAND

HYDRO ELECTRIC DEPARTMENT.

Control and Protective Equipment, for Cobb River Station, Nelson district (Quot. 2080). Oct. 25.

Filtration Plant at Tauranga Borough Council. Nov. 28.

Underground Cables and Equipment, for Invercargill City Council (Con. 105). Sept. 18.

TARIFF BOARD INQUIRIES.

The Commonwealth Tariff Board, Melbourne, advises that the public inquiries into the following subjects will be continued in the Board's offices, Treasury Gardens, Melbourne, on the dates specified: **Plastic sheeting:** What rates of duty should be imposed on printed, polished, or embossed plastic sheeting imported into Australia? 10 a.m., Monday, September 25th, 1950. **Alarm clocks:** What rates of duty should be imposed on alarm clocks classifiable under Tariff Item 318(A)(3)? 10 a.m., Monday, October 2nd, 1950.

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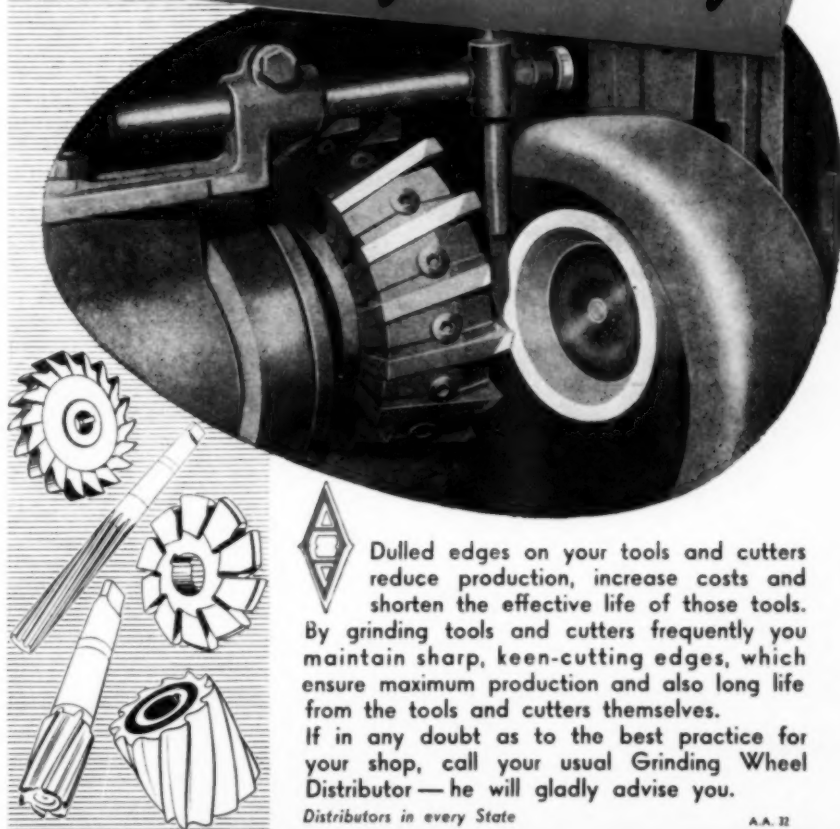
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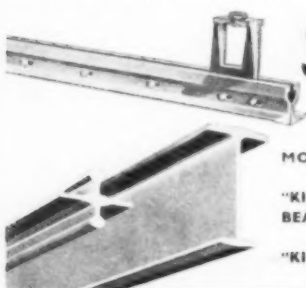
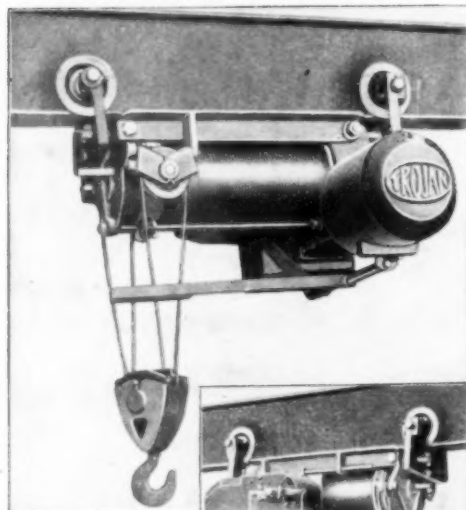


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